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Birds

THE CONDOR

JOURNAL OF THE COOPER ORNITHOLOGICAL CLUB

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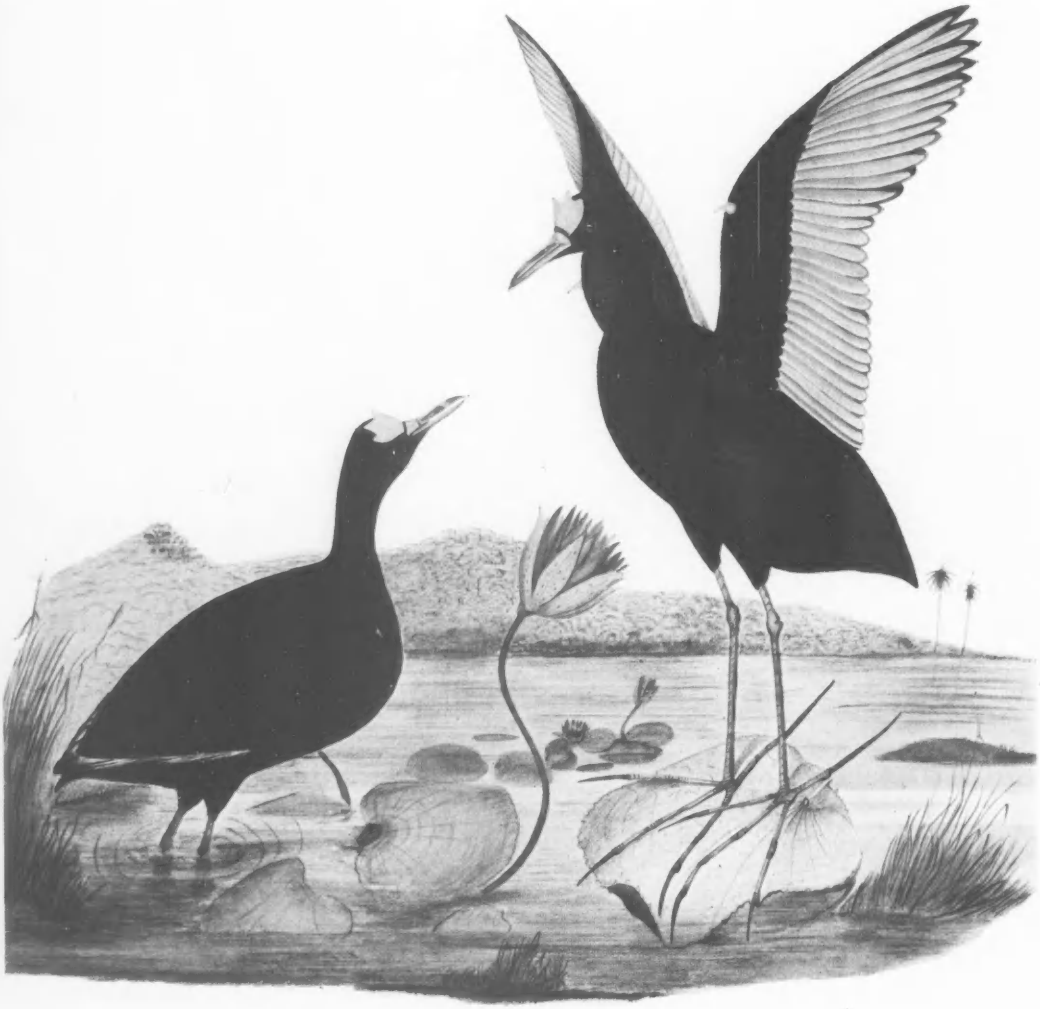
Issued March 15, 1950

CONTENTS

		PAGE
Jacana, painting by Andrew Jackson Grayson	opposite	49
Nesting Behavior of the American Dipper in Colorado	*Harry W. Hann*	49
Nomenclature of the White-fronted Goose	*W. E. Clyde Todd*	63
A Miocene Flamingo from California	*Loye Miller*	69
Notes on the Swallow-wing, *Chelidoptera tenebrosa*, in Surinam	*Fr. Haverschmidt*	74
The Great-tailed Grackles of the Southwest	*Allan R. Phillips*	78
Further Records of the Birds of the Kettleman Hills Area, California	*Ida DeMay Wilson*	82
FROM FIELD AND STUDY		
The San Blas Jay in Arizona	*Allan R. Phillips*	86
Bibliographical Notes on the Birds of Washington by Dawson and Bowles	*W. Lee Chambers*	86
A Comparison of *Pipilo ocai* and the Fossil *Pipilo angelensis*	*William R. Dawson*	88
Heavy Winter Mortality in Pacific Coast Varied Thrushes	*Webster R. Ransom*	88
History of a Wintering Harris Sparrow at Berkeley, California	*Russell H. Pray*	89
Second Record of the Ross Goose from Arizona	*Warren M. Pulich*	90
A Record of the Short-tailed Albatross	*Melvin A. Traylor*	90
Record of the European Nightjar in a State of Stupor	*Edmund C. Jaeger*	90
A Hummingbird Thief	*Frank C. Cross*	91
Further Notes on the Birds of Camp Barkeley, Texas	*Kenneth C. Parkes*	91
Ruddy Quail-Dove in Tamaulipas	*George Miksch Sutton*	93
Unusual Occurrence of Red-winged Blackbirds at Grand Canyon, Arizona	*Harold C. Bryant*	94
A Record of the Black-and-white Warbler in Eastern California	*William R. Fish*	94
NOTES AND NEWS		95
Harold Michener, 1882-1949	*Alden H. Miller*	95
COOPER CLUB MEETINGS		96



JACANA

JACANA SPINOSA

One-half natural size

Painting by Andrew Jackson Grayson

THE CONDOR

VOLUME 52 MARCH-APRIL, 1950 NUMBER 2

NESTING BEHAVIOR OF THE AMERICAN DIPPER IN COLORADO

By HARRY W. HANN

Early naturalists and pioneers in western North America were attracted by the peculiar behavior of the American Dipper (*Cinclus mexicanus*), its aquatic feeding habits, melodious singing, and custom of nesting by swift mountain streams. Many writers have described various phases of its behavior, but none has made consecutive observations that in any sense approach a life history study.

While at the Rocky Mountain Biological Laboratory at Gothic, Colorado, in the summer of 1947, I became acquainted with the American Dipper and spent considerable time observing a nest and the parents and young after the young had left the nest. In the following summer, I arrived at Gothic on June 8 and remained until August 6, spending most of that time studying the dipper. Although June 8 seems like late in the spring season at low altitudes, this was by no means true at Gothic. The last few miles of road to the Laboratory had just been cleared of a remaining snow bank and two mud slides only the day before I arrived, and I was the first person to reach the station for the summer. The weather for a week after I arrived was pleasant, with the temperature going down to about freezing at night and up to 60° or 70°F. in the course of the day; then several days of cold rain and light snow followed before the summer weather returned to stay. Snow banks remained during the summer at a few hundred feet higher altitude.

The laboratory is situated at an elevation of 9,500 feet, about 700 feet higher than Crested Butte, Gunnison County, the nearest town and post office, nine miles away. The chief streams where dippers were found are: East River, from 10 to 60 feet wide, usually about 30 feet; Copper Creek, a slightly smaller stream joining East River at Gothic; and Cement Creek, a still smaller tributary, 7 to 20 feet wide, emptying into East River about 16 miles below, to the southeast. All the streams are very rapid, at least where the dippers are found, and have numerous falls and cascades; their beds are filled with large numbers of rocks of various sizes.

The altitude of the nests studied ranged from about 9,000 to 10,000 feet, thus lying within the Canadian Life-zone, which extends from about 8,000 to 10,500 feet. The chief forest growth of this zone consists of Engelmann spruce, Douglas fir, aspen, and willow, which cover only a limited portion of the surface, the remaining areas, where enough soil is present, being covered with innumerable herbaceous plants, mosses, and fungi (for further description of the area see Knox, 1944).

In making a study of the dipper I soon met limiting factors of time, distance, and inaccessibility. It might take half a day to reach one nest and return. Moreover, the problem of getting to the nests was a vital one. I had to observe two of the best nests with glasses only because they were out of reach without extra manpower and more or less perilous climbing. Most of the time was spent on three nests within a radius of one mile from the laboratory, as it seemed better to visit a few nests regularly than to divide my time among more nests at greater distances. Nevertheless, I did spend considerable time trying to locate other nests, traveling on foot and by car.

NESTS

Nest 47–1. (Observed from distances of 50 to 60 feet. Figure 14.) The first dipper's nest of the study was one which was situated by the falls in East River about 400 yards upstream from the Laboratory in the summer of 1947. On one side of the river is a wall of stratified rock about 30 feet high, and the nest was in a niche half way up the wall. The stream here was about 30 feet wide, and a huge rock which formed an island served as a stopping place for the birds going to and from the nest. Dippers had nested in this same general location in previous years (Knox, 1944:29), and perhaps for ages. On June 30, the parent dippers were feeding young birds in the nest, and the young were reported to have left the nest July 14 or 15. Calculation showed that incubation began about June 4, and hatching occurred about June 20. At least two young birds left the nest, and these were observed frequently from July 20 to 28.

Fig. 14. Left, wall of stratified rock 30 feet high above falls of East River, Gothic area, Colorado. Arrow points to American Dipper nest site, number 48–1, July 2, 1948.
Right, dipper nest, number 48–7, in a wall seven feet above edge of Cement Creek, July 19, 1948.

Nest 47–2. On July 3, 1947, dippers were seen flying in behind Judd Falls in Copper Creek about a mile from the Laboratory. This falls is about 75 feet high and 20 feet wide and is down in a gorge which is about 300 feet deep to the bottom of the falls. The birds flew in at the side of the falls, but they had to pass through a portion of the spray. Judging from the known habits of the birds, there must have been a nest behind the falls, but the location was quite inaccessible.

Nest 48–1. (Observed from distances of 50 to 60 feet. Figure 14). This nest, the first of 1948, apparently was the same nest as 47–1 of the previous year. The location, as nearly as I could tell, was the same, and the nest had the appearance of an old one. The top seemed to be covered with a little soil; some grass was growing from the top; and a small plant, perhaps a *Sedum*, was growing on the back side. The nest was occupied by an incubating bird on June 8, the day of my arrival for the second season. Later calculation showed that the eggs had been laid from about May 30 to June 2 and that incubation had started about June 2. The first apparent feeding of the young was noted on June 18, but hatching, or a part of it, may have taken place on the previous day. The first young bird left the nest at 7:05 on the morning of July 12; two more were out at 6:30 a.m. on July 13; and the fourth left at 7:20 a.m. on July 13. Further observations were made on the parents and young until August 3.

Nest 48–2. (Observed from distances of 30 to 75 feet.) On June 10, 1948, two dippers were found along East River about a mile down the valley from the Laboratory, and soon one bird went to a

nest on the opposite bank from me. The nest was about three feet above the water, which was too deep and swift to wade, and above the nest the bank sloped upward some 200 feet at an angle too steep to descend without a rope. The nest was placed beneath a small spray of rootlets which grew out of the bank, and some grass of the inner portion of the nest was exposed in front. On the morning of June 13, two birds were present, but it soon was evident that all was not going well. One bird, presumably the female, entered the nest; and the other began to peck at the lower portion of the nest and later to pull grass from it. On June 16, a dipper was seen approaching the nest, but it left at once, and no birds were seen at the nest after that. The male seemed to be the dissenter, and his lack of cooperation may have been due to the nearness of another pair of dippers nesting about 400 yards upstream.

Nest 48–3. This nest was found on June 11, by seeing the birds around the nesting site and by seeing a bird entering and leaving the nest. The nest at this time was just being finished. It was beneath the base of a 24-inch Engelmann spruce tree, which stood on the edge of the bank of Copper Creek about one-half mile from the Laboratory. The bank here was about eight feet high, a vertical wall of stratified rock, and the nest was on a sloping root in a crevice of the wall just beneath the body of the tree. The creek at this place formed a cascade 20 feet wide, with about a 35-foot drop in 200 feet of stream. In the middle of the stream just opposite the nest was a large rock almost hidden by water but which caused the water to splash about eight feet high. I reached the nest by climbing down the wall while holding to a rope attached to a tree above. I could not see into the nest, but could reach into it with my hand. I also watched the birds from the opposite bank at a distance of 25 feet, and late in the season when the water was lower, I watched from the exposed rock 12 feet from the nest.

There was no activity around the nest for several days after I examined it on June 12, the day after its discovery, but on June 19, when I had almost concluded that I had caused them to desert the nest, I found two eggs in it. Another egg was added on June 20, and a fourth on June 21. On the evening of July 7, there were two young birds in the nest, and another hatched later, apparently on the following day. One egg which had a dent three millimeters in diameter in the shell failed to hatch and remained in the nest. On July 16, I banded the young birds with a metal band on the left leg of each, and a colored celluloid band on the right. All three of the young birds left the nest on August 1 between 7:09 a.m. and 4:00 p.m. Two were found on a narrow ledge of rock below the nest; and the third, 100 feet down stream. All three banded birds were seen on August 2, 3, and 4; and two, on August 5, the last day of observation.

Nest 48–4. (Observed from a distance of 25 feet.) This nest was found on June 28, 1948, and was first seen at a distance of about 200 yards as a brown spot on the side of a gray shale wall. It was situated at the edge of East River about 400 yards upstream from nest 48–2. The wall was about 40 feet high at this place, and the nest was in a niche, 10 feet above the edge of the water. A hundred feet up stream was a waterfall six feet high, and about the same distance below was another fall somewhat smaller. The parent dippers, when the nest was found, were feeding young, which later calculation showed were four or five days old. Only three young birds were seen in the nest at one time until July 10, when a fourth was noted. The female was not seen after July 14, but the male kept up the feeding of the brood. On July 18 at 7:05 a.m. the first young bird climbed out of the nest and fluttered down to the rocky ledge at the edge of the water. Two more left in the course of the day or early the next morning, and the last left on July 19. Young of the brood were seen at various times up to July 31, when a young bird believed to belong to this brood was last seen a mile away in another nesting territory.

Nest 48–5. On July 1, 1948, an empty dipper's nest was found along Copper Creek about one and one-half miles from the Laboratory. It obviously was built during the early part of the season, but for some reason was deserted. A pair of dippers whose nest could not be found at the time was seen about 200 yards down stream from here on June 12. It is probable that the nest belonged to this pair and that they were forced to abandon it by another pair (48–6) which nested a half mile or so upstream. The nest was built in a niche in a shale wall six feet above the water.

Nest 48–6. On July 11, 1948, two dippers were seen feeding in a beaver pond about two miles up Copper Creek from the Laboratory; and on July 14, further investigation revealed a nest near-by with three young birds nearly ready to leave. The nest was built in the bottom of a large uprooted tree which had stood at the edge of the creek on low ground and had fallen away from the creek at a

right angle. The nest was six feet above the water and was overhung by a large spray of rootlets. I watched the feeding from a distance of 25 feet, and on July 15 I waded the creek with the aid of a pole and examined the nest more closely. On July 23 the nest was empty and one young bird accompanied by an adult was near the nest.

Nest 48–7. On July 16, 1948, Dr. B. R. Coonfield reported finding two dippers' nests (48–8 and 48–9) along Cement Creek, 23 miles from the Laboratory. On July 19, I visited these nests and found a third one (48–7). I observed the nests again on July 20; Dr. Coonfield visited them on July 24; and I made a final trip to them on August 2. Nest 48–7 was located in the "First Gorge" of Cement Creek where the stream was narrow and swift, making a drop of about 20 feet in 250 feet of length. The stream was bordered and somewhat overhung by a wall of igneous rock about 25 feet high, and the nest was in a niche seven feet above the water (figure 15). The nest was empty when found, but had been used earlier in the season as shown by droppings on the rocks and by the presence of a young dipper a short distance up stream.

Nest 48–8. This nest was by Cement Creek in the "Second Gorge," which was about three miles up stream from the "First Gorge." The nest was placed in a small niche beneath a ledge of rock that projected out over the edge of the creek. The water was shallow at the edge, and the nest, which was only five feet above the water, was easily approached. On July 16, there were two eggs in the nest, and on the 19th there were five, indicating that the last had been laid that morning. The eggs, however, never were incubated and were still present on August 2, when both nest and eggs were collected. My removal of the eggs for photographing on July 19 may have contributed to the desertion, but more likely the lateness of the season found the female so depleted in breeding impulse that she could not continue with the duty of incubation. The presence of a nesting pair (48–9) 400 yards down stream may have been a hindering factor also.

Nest 48–9. Unlike the other nests, this one was situated by a stream small enough in places to step across, a tributary of Cement Creek which flowed down a steep mountain side over numerous ledges. The nest was completely hidden beneath a wet bank of moss, roots and soil, about 100 feet from the mouth of the stream. On July 16, 19, and 20, the parents were busily feeding the young, going under the bank a little down stream from the nest, and emerging a few moments later three feet farther up stream. On July 24, the young had left the nest, and one was being fed near by. On August 2, I dug away the outer bank with a shovel and found the nest nicely placed in a second bank within. The water was only two inches below the bottom of the nest at that time and must have been higher early in the season.

NESTING BEHAVIOR

Territory.—The area occupied by a pair of dippers in the Gothic region during the nesting season consists of a stretch of stream and its banks a half-mile or so in length and sometimes near-by tributary streams and beaver dams. Occasionally dippers fly overland, but nearly always in flying they follow the stream closely and rise only a few feet above the water. Feeding and the securing of food for the young may occur anywhere from the immediate vicinity of the nest to 300 or 400 yards up and down stream. That disputes over territory may occur was indicated by the desertion of three different nests (48–2, 48–5, and 48–8), at least two of which probably were abandoned on account of adjacent nesting pairs of dippers. Young birds may leave the home territory with a parent within a few days after leaving the nest, or they may remain until they become independent. Parents appear to go up and down stream regardless of territory after they no longer are obliged to care for young.

The nesting site.—Two characteristics common to all of the dipper nests observed were their location over, or nearly over, the edge of a stream, and their high degree of inaccessibility. The water beneath in most instances was swift and deep, thus forming a barrier to approach; and the usual location of the nest in a niche in a wall completed the protection. Since the wall closely bordered one side of the stream, the observer nearly always found himself on the opposite side of the stream from the nest. A person does not usually have much trouble in finding a nest after once locating the pair of birds,

for the parents will reveal the location by going to it if the nest is not in plain sight. Some of the nests were located where the spray kept them moist, but this was not universally true and apparently had nothing to do with the success of the nest.

A summary of the nest sites is as follows: 7 in niches in vertical walls, over, or nearly over, the edge of rapidly flowing water, the height above the water being 3 to 15 feet; 1 behind a large waterfall; 1 beneath the base of a large spruce tree which stood at the edge of a cascade; 1 in the bottom of an uprooted tree over the edge of swift water; 1 beneath the bank of a small rapidly flowing stream, about two inches above the water.

Nest structure.—A dipper's nest consists of two parts, an outer spherical or dome-like shell and an inner bowl-shaped lining. The outer portion varies considerably in size, ranging from eight to twelve inches in diameter. It is composed chiefly of moss and a few stalks of grass, which may include the roots. The entrance hole is in the exposed side and measures about three inches in width by two inches in height. The inner chamber is globular and about five and one-half inches in diameter. Any projecting portions of the wall are not covered with the outer shell, but are bare within the nest. Also the outer covering is absent from the bottom of the nest. The inner bowl of the nest is about three inches in width and two inches in depth, inside measurements. It is composed of coarse grass which resists moisture, as opposed to the moss of the outside which absorbs it. Nests which are reached by the spray from the water thus remain moist and green without but are relatively dry inside. In nests which are located above the spray, the moss of the outside may be dry and brown.

Egg-laying and eggs.—At the only nest under observation before egg-laying (48–3), a period of six days elapsed from the last time the birds were seen around the nest until the first egg was laid. This, however, may be longer than the usual rest interval. Incomplete data at two nests indicated that the eggs were laid on successive days. One egg was laid between 7:11 a.m. and 10:38 a.m. (nest 48–3), although a bird had entered the nest at 6:31 a.m. and remained 12 minutes without laying. Four eggs constituted a clutch in one nest and five in another. The number of young in other nests were three, four, and four, but these numbers may not represent the full number of eggs laid. Nine eggs of two clutches averaged 26.2 millimeters by 19.1 millimeters. The eggs are white.

Incubation and hatching.—Incubation began at nest 48–3 between 4:03 p.m. of June 21, the day the fourth and last egg was laid, and the following day at 11:19 a.m. It is probable that it began in the evening. Two young birds were found hatched on the evening of July 7, and one hatched later. Thus the incubation period would be a scant 16 days for two of the birds and somewhat longer for the third, if incubating began on the evening of June 21. If it began on the morning of June 22, which seems less likely, the period would be 15 or 16 days. The incubation period may be taken then as 16 days ± 1 day. The approximate dates for the beginning of incubation in five nests with the dates of hatching and leaving the nest are given below. Those marked with an asterisk are only calculated.

Nest	Beginning of incubation	Hatching	Leaving the nest
48–1	June 2*	June 18	July 12-13
47–1	June 4*	June 20*	July 14-15
48–4	June 8*	June 24*	July 18-19
48–6	June 8*	June 24*	July 18-19
48–3	June 21	July 7	August 1

Incubating, as far as could be observed, was done entirely by the female. The male carries food to the female and was seen feeding her as many as seven times during one

period in the nest. The periods of incubating are long compared with those of many species, correlated with the fact that the female does not have to spend so much time searching for food. Periods of about one hour and 20 minutes at the nest, and 12 to 21 minutes away from the nest were observed.

Development and care of young birds in the nest.—Newly hatched dippers, like the young of practically all other passerine birds, are covered with a coat of down. Growth of the young birds is comparatively slow, perhaps an evolutionary result of their comparative safety in the nest and the large amount of work required by parents in securing food. This slow growth, coupled with the advanced stage of maturity at which the young leave the nest, makes the period in the nest one of the longest of any passerine bird of its size, namely 24 to 25 days. The male parent carries food to the young and may feed them while the female rises to let them poke their heads out. The proportions of feeding done by the male and female vary with the individual pairs. One male did only a small share of the feeding and for many days refused to feed at all when I was near the nest. Other males fed as much as the females, and one took care of the brood alone after the disappearance of the female three days before the first young bird left the nest. In spite of the work involved, feeding goes on at a fairly rapid rate, although the helpings are often small. Timing of the different pairs showed feeding every four or five minutes when the young birds were small, with an increase to every two or three minutes when they were larger. This rapid rate, however, is punctuated with intervals of rest which may last 15 or 20 minutes.

The delivery of food to the mouths of the young takes place quickly, and during the latter part of the period in the nest may require only a fraction of a second. At two nests where there were suitable approaches, the parents would alight a few feet below the nest and then complete the trip by hopping and running; but at another where there was no approach they alighted within reach of the nest. At one nest which had no adjacent room for perching, the parents clung to the lower edge of the nest while feeding. By the end of five or six days, the young birds are able to reach out for food at the opening of the nest. Only two or three can find room at the opening at one time, and the extra one, or ones, must remain in the back of the nest and await their turns. In delivering food, the parents make little attempt to distribute the food among the different young birds, but repeatedly feed the nearest one. This unequal feeding is augmented by the fact that any standing room for the parent is apt to be at one side of the nest opening rather than directly in front. A slow rotation of birds, however, as a result of change of places at defecation time, permits all of the young to get a share of the food. The young birds call loudly at feeding time, especially during the latter part of the period in the nest. The first calling was heard when the young were about four days old, but this was at a distance of 25 feet and amid the roar of water. When this calling was first heard, I thought it was done by the parent, but in light of the later calling, I concluded that it was done by the young.

Brooding by the female is kept up regularly for about one week after hatching, and it was observed up to the sixteenth day in the nest. At the later dates she entered the nest with much difficulty and remained but a short time. Periods of brooding observed were from 5 to 61 minutes, but usually did not last more than 25 minutes. Two brooding periods on the sixteenth day lasted only 6 minutes each. Periods away from the nest during the first few days were from 8 to 22 minutes in length. The male never was known to enter the nest.

Sanitation at the nest is executed with a fair degree of efficiency. Parents carry away the fecal capsules at first as they are extruded; but later the young birds, from the time they are a week old, turn around and extrude the capsules over the edge of the nest.

These may lodge on the outside of the nest, or on projecting rocks below, or may fall into the water. Capsules found on the side of the nest or on rocks are carried away by parents on following trips and deposited in the edge of the stream. Carrying away the extruded capsules, however, does not ordinarily prevent a soiled appearance of the rock wall below the nest, or even of the nest itself. One puzzling feature in connection with sanitation was the dribbling of fecal capsules onto rocks below before the young were old enough to back out over the edge of the nest. The solution was found when a brooding female was seen taking a capsule from a young bird beneath her and dropping it over the edge of the nest.

As time to leave the nest approaches, the young birds become very alert, watching eagerly for food and taking in all the landscape with their dark beady eyes. One young bird was seen turning its head around through about 135° to see something above. One brood showed extreme fear as I approached the nest when they were about 20 days old. They flattened out in the bottom of the nest and occupied only a small portion of the cavity that they seemed to fill so completely a few minutes before.

Young birds out of the nest.—When the young dippers leave the nest they appear to be nearly as large as their parents. They are a little lighter in color, especially on the throat and the outer borders of the wing feathers, and are faintly streaked and mottled below. The tail does not have its full growth.

The young birds may creep out of the nest and cling to the rocky wall, then reenter the nest before leaving permanently. At final leaving they flutter down from the nest, or from a perch near by, to a suitable landing place. In the three instances observed, all the young of a brood alighted on the same side of the stream, the side which seemed from the observer's point of view to be the better one. In two instances this was on the same side of the stream as the nest, and in the other, on the opposite side. At two of the nests, 24 hours or more elapsed between the time the first and last young left.

It seems to be the habit of the parents, or a parent, to remove the lining of the nest soon after the young leave. At one nest the last young bird had not yet fluttered down from the wall near the nest when one of the parents went to the nest and began pulling out the grass lining, making six or eight trips. At another nest, grass from the lining was found on a rock below the nest on the day after the young had left, and two nests which were collected some time after the young left had no lining left in them. One nest which was deserted as soon as the eggs were laid was left with the lining intact. The significance of tearing out the lining is not clear. Three possible reasons might be: (1) the prevention of further use of the nest by the young; (2) a preparation of the shell for use during another year; or (3) a carryover from a time when parts of the lining were removed on account of being soiled by excreta.

As soon as the young birds land outside the nest, they begin to move about, taking a few quick steps at a time and dipping at the rate of about once each second. They do not hop at first as do most passerine birds that run or walk at a later stage. Within a few minutes they enter the edge of the water if it is shallow and bathe by fluttering their wings; or they may swim if the water is too deep for wading; or they may poke their heads under as if searching for food. Such trips into the water do not usually last long, however, and the young spend most of their time ashore on rocks or logs or in slowly exploring the rough banks. During the first day out of the nest the young are apt to remain within a dozen yards of the nest if left undisturbed. They are not averse to creeping into crevices, if such are at hand, or to climbing along a steep bank near rapidly flowing water. A person may expect at such times to see them slip into the torrent, but this does not occur, at least ordinarily. The young birds, as well as the adults, are able to cling to very slippery surfaces, and if they slip, they resort to the use of their wings

and perhaps to swimming to regain their footing. For an hour or so after the young emerge from the nest they are rather active, but they finally tire and spend much of the time standing still or picking at themselves. They are difficult to see when quiet, for their color harmonizes with that of the rocks, especially with the shale of the Gothic region. Parents feed the young at intervals, and at feeding time the young call loudly and flutter their wings vigorously. Young birds usually are able to distinguish their parents from their brothers and sisters, as indicated by their calling for food only when seeing their parents. The young birds begin to peck at objects before they leave the nest, and this is continued with gradual increase when they are out. At first the pecking seems to net them little, but within a few days it is furnishing them with no small part of their subsistence.

Fig. 15. Juvenal dipper on board at edge of East River on the day it left nest 48–1, July 12, 1948.

Young birds ordinarily may be found within the nesting territory during the first two or three days; then some may move to a greater distance. Three color-banded young which left nest 48–3 on August 1 were found on August 2 at separate places within 150 yards of the nest; on August 3 they were within 200 yards of the nest; and on August 4, within 350 yards. On August 5, one was found one-fourth of a mile away; another was being fed by a parent one-half mile from the nest; and the third was not found. I did not follow them longer because of my departure from the area.

At nest 48–4 where the female was missing, only three out of four young were seen after they left the nest. A week later two of these were found 500 yards down stream where they were busily feeding, and no parent was seen in an hour and 25 minutes of watching. Four days later a young bird believed to belong to this brood, and probably one of these two, was found a mile away in territory 48–3, begging for food from the adult birds as they gathered food for their nestlings. It was fed at least three times, but on the following day when it begged for food, one of the adults apparently made an unfriendly gesture, for the young bird, quite frightened, flew up on the bank and alighted within six feet of me. It was not seen begging again, but it remained in the area and gathered its own food. It is very doubtful whether this young bird or its fellow received any food from its parent after it was a week out of the nest.

In territory 47–1, young birds were watched in 1947 from the end of the first week out of the nest until the end of the second. One parent was caring for a young bird

above the falls; and the other, for another below the falls. Parents did not ordinarily invade each other's portion of territory, and once when two adults were seen near each other, one expressed dissatisfaction by fluttering and scolding. Young birds were fed several times in succession and then were left alone for a half hour or more. The last feeding seen was when the young were about 11 days out of the nest. On the following day a young bird appeared to be calling for food but none was forthcoming.

In the same territory in 1948, only three out of four young birds were accounted for at one time after they left the nest. Four days after leaving, one parent was caring for one young bird and the other for two. When the young had been out of the nest 17 days, a parent and young bird were seen feeding near each other quite independently, and neither paid any attention to the other in the one hour and 50 minutes that I watched. Three days later two adults were seen some distance above the falls. One was believed to be from another area, but the other made no attempt to defend the territory; it only showed disapproval when the first bird came within two feet of it.

Enemies and survival.—No nests or their contents were disturbed by enemies during the study. One female dipper disappeared while the young were in the nest, but I found no indication of what happened to her. The most dangerous time for the species is just after the young leave the nest, when they are an easy prey for predators, or when they may be dashed to their death by the swift currents. Observations indicate that ordinarily not more than two young from each brood reach the independent stage.

DISCUSSION

Along with many undisputed details concerning the natural history of the American Dipper, there have been many conflicting and doubtful statements by various authors. Some of these will be discussed in connection with a series of topics to which they are related.

Placing the nest where it is kept wet by spray.—The first dipper nest that I have found recorded was discovered by Cooper (Cooper and Suckley, 1859:175) among the roots of an upturned arbor vitae floating in a millpond in the state of Washington; no mention was made of spray. Another recorded by Platt (Coues, 1874:11) was constantly wet by spray. Muir (1894:290) says that "usually" the nest is within reach of the spray and kept green "at least during the time of high water." Muir further states that the nest is far from being easily detected, and that "this is more especially the case where the nest is kept fresh by being well sprinkled." He thus implies that some nests are not kept fresh by sprinkling. Ridgway (1904:675) says that the nest "usually" is in contact with spray, and Sclater (1912:476) says that it "nearly always" is. Skinner (1922:21) speaks of a nest that "had a unique location in that there were no falls or rapids near, and consequently no spray to keep the moss green." Grinnell and Storer (1924:546) make the unqualified statement that "The American Dipper nests amid the surroundings which harbor it throughout the year, placing the structure on a rock close to or over rushing water where the surface of the nest will be kept wet by spray." In my own observations, seven out of eleven nests were located where they were dry and received little or no spray. One nest beneath a bank must have been quite moist all summer, as was one behind a large waterfall.

Spraying the nest.—Reports of a dipper spraying the nest appear to be based on observations made by J. Stevenson (Coues, 1874:13) near Berthoud Pass, Colorado. He says of the dipper, "One of the first things that attracted my attention was its manner of diving down into the water and then darting back and perching itself on the summit of its mound-like dwelling, where it would shake the water from its feathers and distribute it over the nest, apparently for the purpose of keeping the moss moist and in a growing condition, thereby increasing its strength and dimensions . . . . The operation

of sprinkling the nest was repeated daily." Assuming that Stevenson correctly recorded what he saw, I should like to inquire into the significance of this behavior. Muir (1894: 287) tells of seeing an ouzel leave its singing perch on a snag, dive into the water for food, then return to the same snag where it showered the water-beads from its feathers and continued its singing. Perhaps Stevenson's bird was performing similarly, merely using its nest for a perch. Be that as it may, I know of no other case of a dipper even standing on its nest.

Method of locomotion on land.—Ehinger (1930:489) observed a dipper "running" up a steep bank, and Bent (1948:101) says the young "seem to know instinctively, as soon as they leave the nest, how to run, climb, dive and swim." Grinnell and Storer (1924:545) state, however, that "When hunting along the shore the bird moves by short hops." My own observations are that the birds ordinarily run, but may resort to hopping where the way is too rough or steep for running.

Walking under water.—Cordier (1927:173) says, "I could see the Ouzel wade on the bottom of the pool, where the water was two feet deep." Knowlton (1928:162) says, "the wings must ke kept in action. The moment they cease, up comes the bird like a cork." Knowlton further infers that it cannot walk on the bottom because it is not a "walking" bird. Tucker (Witherby, *et al.*, 1938:222) says of the European Dipper (*Cinclus cinclus*) that the force required to keep the bird down is only slight, and there is no serious mechanical problem involved. Most observers, including myself, agree essentially with Grinnell and Storer (1924:545) when they say, "the dipper dives directly into the stream, usually against the current, and then seemingly walks along on the bottom, the wings assisting."

The part of the eye which does the winking.—Olive Thorne Miller (1894:82) believed it was the "snowy white eyelids" which did the winking. Grinnell and Storer (1924:544), on the other hand, state that "The nictitating membrane or 'third eyelid' is whitish in the Dipper, and, when drawn backward across the eye, as it frequently is when the bird is above the water, can be seen at a considerable distance." This statement is incorrect, however, in saying that the lid so easily seen moves *backward* across the eye, since it moves down from above.

Townsend's article (1925) on the "Winking of the Water Ouzel" states clearly how the winking takes place. The upper lid, which is covered with short white feathers, merely moves downward exposing the whitish portion. This should have settled the matter, but Cordier (1927) replied with an astounding article describing how he had watched a nesting bird and its winking nictitating membrane from as near as eighteen inches and had taken moving pictures of the process. A careful reading of Cordier's description, however, reveals some discrepancies. He states (p. 177) that "the external layer of the upper lid is like any other part of the bird's naked skin surface." This is incorrect, for it is covered with white feathers. The nictitating membrane, he says, is "glistening, pearly-white," and these terms fit precisely the feathers of the upper eyelid. The time required for winking, as shown by the camera, was about one-third of a second, but, he says that "some of the winks are so quick that they may be compared to the rapid action of a focal-plane shutter of a graflex camera." I am convinced, after careful reading, that Cordier in the first case was looking at the winking upper lid, but that in the second, he was watching the actual nictitating membrane. This interpretation is in accordance with observations made by Ehinger (1930:490), who said, "being at very close range [he] noted particularly the winking of the white-edged eyelids and the flash of the third eyelid or nictitating membrane." Eggebrecht (1937:665) was unable to harmonize the accounts of Cordier and Townsend, but did not quite agree with me as to where the error was.

The incubation period.—Steiger (1940:13) states that the incubation period is 13 days, but does not tell how he arrived at that figure. Eggebrecht (1937:652) gives the incubation period of *Cinclus cinclus aquaticus* as 15 days, but since he did not observe the exact time of the beginning, it may have been 16 days. Jourdain (Witherby, *et al.*, 1938:220, 223) gives the incubation period of *C. c. cinclus* as 15 to 16 days and that of *C. c. gularis* as 15 to 17 days, usually 16 days. These figures for the European races of *Cinclus cinclus* closely correspond with my own for the American form, which was 16 days ± 1 day.

The length of time the young remain in the nest.—Steiger (1940:13) gives 18 days for the American Dipper; Eggebrecht (1937:675) says that *C. c. aquaticus* left on the twenty-fourth day; and Jourdain (Witherby, *et al.*, *loc. cit.*) gives 18 to 19 days for *C. c. cinclus*, and 19 to 24 or 25 days for *C. c. gularis*. My observed time for one nest was 24 and 25 days, and approximately the same for two other nests at which the time was less exactly determined. Since young birds will leave the nest before the normal time if frightened, it seems likely that any of the dippers mentioned may leave as early as 18 days under stress, but that they will remain for 24 or 25 days if unmolested.

The number of broods per season.—Cooper (Cooper and Suckley, 1859:175) and Cordier (1927:170) each state that a brood was reared earlier in the season before the one at that time under observation, but evidently both of these men were accepting the word of some other person. Bent (1948:101) thinks that probably two broods are raised under favorable circumstances. Gale (Henderson, 1908:3) did not think that more than one brood is reared in Colorado, and certainly that is true around Gothic at an elevation of 9,000 to 10,000 feet. The long period through which eggs have been found over the country as a whole—from the last of March until the middle of July (Bent, 1948, and my own data)—lends some support to the two brood theory, but no reliable record of two broods is available. Jourdain (*loc. cit.*) says that *C. c. gularis* is double-brooded as a rule, possibly three occasionally and that *C. c. hibernicus* of Ireland rears two broods; but Eggebrecht (1937), whose study of *C. c. aquaticus* lasted to the end of June, makes no mention of a second brood.

Eggs in nests which have no lining.—Bent (1948:100) quotes from A. A. Saunders, apparently in a personal letter, regarding dipper nests in Montana: "Some dipper nests, built on rocks, are without a bottom or lining, the eggs being deposited on the rocks, the nest being merely a roof, side walls and the usual front entrance, made of woven moss." In answer to this I will say that such nests appear to be the rule after the young have left. I have two collected ones of this kind in my possession. I also saw, however, a parent tearing the lining from a nest immediately after the last young bird had left, and at another nest portions of the grass lining were found on the rocks below on the day following the exit of the young. This evidence indicates that dippers regularly remove the lining of nests as soon as the young leave. Perhaps Saunders found some of these used nests and inferred that they never had possessed a lining.

The natal down.—Steiger (1940:13) says that "from the first, the young Ouzel has a complete coat of down." Bent (1948:102) apparently thought this was a plumage other than the usual natal down, for he said, on the evidence of Steiger's statement, "This down becomes a necessary protection by the time that the young bird takes its first plunge, at an early age, into the cold water." I have observed this down, and, though fairly heavy, it is the usual passerine natal down. When the young birds are about two weeks old, the down may be seen standing up like a pompadour on the heads of the young birds as they peer from the nest. It has disappeared, however, by the time the young leave the nest, leaving the bird in possession of the usual juvenal plumage.

Other contentions.—Steiger's popular article about the dipper (1940) contains a

number of doubtful and misleading statements in addition to the erroneous ones mentioned above regarding the periods of incubation and the remaining of the young in the nest. He says (p. 13) that "amidst raucous calling, the experimenting young follow the creek. Flying at short distances, the parents entice their charges from rock to rock, seeming to encourage them to greater and braver acts. The fledglings' first flights are comically clumsy. When attempting to perch, they frequently tumble into the creek .... On the first days out of the nest, the parents hide their young after they have been fed." My observations show that the young remain quiet near the nest for at least the first day, and when they do travel, they run or flutter along awkwardly but carefully, picking and choosing their own way, and occasionally creeping into crevices. Under usual conditions they are *not led* by the parents, though parents might try to lead them out of danger or induce them by warning calls to hide if they were crowded too much by threatened danger. I never have seen a young bird *tumble* into the water, but I can see how they might do so if caused to become too much excited.

Steiger (*loc. cit.*) states that "even after the brood is mature, the parents will fly to them with a choice larva that the fully grown beggars greedily accept." Eggebrecht (1937:675) also says of *C. c. aquaticus* that the young stayed with the parents and were fed by them for over a month after leaving the nest. I should like to have definite proof by means of banded birds before accepting these statements, which seem to imply, at least in the American species, that young birds beg and receive food from their parents after once becoming independent.

Steiger (p. 14) says, "On a single stream you may find several birds living separately as hermits .... In each of the cases I have noted, the solitary birds have been males whose mates, evidently, have died or perished during the hazardous nesting season. This circumstance suggests a monogamous mating pattern as a characteristic of the species. Young birds pair late in the summer, but do not become markedly attentive to one another until the coming of spring." Even if the mortality is higher in the female, and the birds ordinarily pair for life, both of which remain to be proved, this would not preclude the possibility of males left without mates from mating with young females of the first year. If, on the other hand, dippers change mates often, as many species do, there could scarcely be any regular pairing off of the young birds late in summer, but rather a mixed pairing of all ages at the mating season.

Steiger states (p. 14) that "the water snake, mink, marten, the skunk, weasel and other stream-frequenting animals continuously prey upon the mother and young." I see no objection to rating the above named animals as *potential predators,* but it would take long and careful observation to establish the facts regarding predation even in one locality. He states that "During the nesting period and while the young remain dependent, they give no body odor," and hence cannot be scented by predators. He does not tell, however, how he arrived at this conclusion, or whether the dippers are different from other birds in this respect.

SUMMARY

The American Dipper was studied in the Gothic region of Colorado at an altitude of 9,000 to 10,000 feet, in the summers of 1947 and 1948.

Eleven nests were observed, eight of which contained eggs or young.

Egg laying at five successful nests extended from about May 30 to June 21, and incubation, according to one record, lasted 16 days ± 1 day.

The young remained in one nest 24 and 25 days and in two other nests approximately the same time.

When leaving the nest the young flutter down and exercise considerable choice as to where they land.

The parents, or a parent, seem to have the habit of removing the lining of the nest soon after the young leave.

The young birds are fed in the vicinity of the nest by both parents at first, but within a few days may wander away, sometimes outside the home territory. Each parent then cares for a portion of the brood. Probably not more than two young out of a brood, as a rule, reach the independent stage.

Young birds begin picking up food from the time they leave the nest. They normally become independent of their parents in about two weeks, but apparently they can obtain all their own food by the end of one week after leaving the nest.

No nests or contents were disturbed by predators during the study; one female disappeared while the young were in the nest, and the brood was fed by the male alone.

The literature on dippers has been reviewed and the following conclusions reached regarding controversial and doubtful statements found therein:

1. Dipper nests are not always built where they receive spray.
2. Reports of a dipper spraying its nest to keep it moist are based on one record, which is open to doubt as to interpretation.
3. Dippers ordinarily travel on land by running, but may *hop* where the way is rough or steep.
4. When under swift water dippers apparently walk on the bottom, against the current, and receive some aid from their wings.
5. The slow winking accompanied by a flash of white is done by the white-feathered upper eyelid. A more rapid flash of the nictitating membrane apparently may be seen at very close range.
6. The incubation period of the American Dipper, as observed in the study, corresponds with records of the European species (*C. cinclus*) of 15 to 17 days; the young of the American and European species probably always remain in the nest about 24 or 25 days if undisturbed, but they may leave as early as 18 days if frightened.
7. There is no reliable record of the American Dipper raising more than one brood in a season. The European species has been reported to raise two or even three broods.
8. The statement that the dipper lays eggs in nests with no lining is contrary to observations made in this study.
9. The coat of down on newly hatched dippers is the normal passerine natal down.
10. Statements that the parents lead and hide the young which have left the nest, that the young frequently fall into the creek, that parents feed the young after they are fully grown, that solitary birds along the stream outside of the breeding season are males which have lost their mates, that young birds pair late in summer, and that young dippers give off no odor, all need qualification or are unproven.

LITERATURE CITED

Bent, A. C.
1948. Life histories of North American nuthatches, wrens, thrashers and their allies. U. S. Nat. Mus. Bull. 195.

Cooper, J. G., and Suckley, G.
1859. The natural history of Washington Territory (New York, Baillière Bros.).

Cordier, A. H.
1927. Some observations on the water ouzel. Auk, 44:169-178.

Coues, E.
1874. Birds of the Northwest. U. S. Geol. Surv. Terr. Misc. Publ. No. 3.

Eggebrecht, E.
1937. Brutbiologie der Wasseramsel (*Cinclus cinclus aquaticus* (Bechst.)). Jour. für Ornith., 85:636-676.

Ehinger, C. E.
1930. Some studies of the American dipper or water ouzel. Auk, 47:487-498.
Grinnell, J., and Storer, T. I.
1924. Animal life in the Yosemite (Berkeley, Univ. Calif. Press).
Henderson, J.
1908. The American dipper in Colorado. Bird-Lore, 10:1-7.
Knowlton, F. H.
1928. The bird of spray and water. Nature Mag., 12:161-164.
Knox, D. A.
1944. Summer birds of the Gothic area, Gunnison County, Colorado. Auk, 61:19-30.
Miller, Olive Thorne
1894. A bird-lover in the West (Boston, Houghton, Mifflin and Co.).
Muir, J.
1894. The mountains of California (New York, The Century Co.).
Ridgway, R.
1904. Birds of North and Middle America. Part III. U. S. Nat. Mus. Bull. 50.
Sclater, W. L.
1912. A history of the birds of Colorado (London, Witherby and Co.).
Skinner, M. P.
1922. Notes on the dipper in Yellowstone National Park. Condor, 24:18-21.
Steiger, J. A.
1940. Dipper, wilderness dweller. Bird-Lore, 42:10-14.
Townsend, C. W.
1925. The winking of the water ouzel. Condor, 27:143-144.
Witherby, H. F., Jourdain, F. C. R., Ticehurst, N. F., and Tucker, B. W.
1938. The handbook of British birds. Vol. 2 (London, H. F. and G. Witherby Ltd.).

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NOMENCLATURE OF THE WHITE-FRONTED GOOSE

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Notes and data on the White-fronted Goose (*Anser albifrons*) were orginially elaborated for presentation in my projected report on the birds of the Labrador Peninsula, but since the matter is of current interest in view of the expected appearance of the fifth edition of the A. O. U. Check-List, and since there have been certain new developments requiring fuller consideration, I have decided to put my conclusions on record now. The paper is based primarily on a study of the series of specimens (53) of this species in the collection of the Carnegie Museum and of the literature pertaining to the subject. It will be necessary to recapitulate briefly the taxonomic history of this species and its nomenclatural vicissitudes.

The White-fronted Goose was not known to Linnaeus. It was first introduced to science by Scopoli, an Italian author, under the name *Branta albifrons*, in 1769. No locality was mentioned, but it is fair to presume that the specimen he described must have come from Italy, and I would so restrict the type locality. Of course, the species is only a winter resident in southern Europe, since it goes to the far north to breed, as later authors presently discovered. Eventually it was traced completely across the continent of Asia, and then to North America. The long list of references given by Salvadori (1895) and by Alphéraky (1905) testifies to its wide distribution. While it did not escape synonyms, and while certain variations had been noted, it was not until very recently (1948) that convincing proof was offered that more than one race occurred in Europe. Long before this, however, in 1852, Hartlaub had attempted to describe a new "species" of White-fronted Goose from North America, basing his separation wholly on larger size. European ornithologists, confused by his inadequate description, and lacking authentic material representing the American bird, were tempted to refer all large specimens from their side to Hartlaub's *gambeli*.

American ornithologists were almost as much in the dark as their European colleagues, since the American bird passed under the name *gambeli* for many years, and it so appears in three editions of the A. O. U. Check-List. Some thirty years ago, however, Swarth and Bryant (1917) published the results of a study of the White-fronted Geese of California. Their findings were, in brief, that two distinct races of this species occur in that state in the winter, and that these races differ from each other mainly in size, but to some extent also in coloration. The smaller form is the commoner of the two and appears to be identical with true *albifrons* of Scopoli (or so the authors believed). However, they had no European specimens for direct comparison, and their measurements for such were taken from Alphéraky's account (1905). The larger form, they concluded, must be called *gambeli* of Hartlaub, although they admitted some uncertainty about his measurements.

Later Kuroda (1929), like Swarth and Bryant, reproduced Hartlaub's original description, but with millimetric equivalents of the measurements added, and what is more to the point, he cites his own measurements of the three specimens in the Berlin Museum purporting to be Hartlaub's types. The two sets of figures do not agree at all; indeed, the discrepancy is so great as to lead him to question the authenticity of these types as such. Despite his misgivings, however, he accepts the name *gambeli* (or *gambelli*, as he prefers to write it) on the basis of the original description. More clearly even than Swarth and Bryant, he points out the differences between the two races and illustrates them with figures of the head and the tarsus. For the first time, too, we are given measurements of two breeding specimens from the Arctic coast. Concerning these he

remarks they are "evidently larger birds than the three preserved in the Berlin Museum." However, their measurements agree well enough with those of a California winter bird which he figures. He had some eastern Asiatic specimens for comparison, but apparently he had none from Europe.

According to this authority, the so-called Tule Goose is distinguishable from *albifrons* "by enormously larger size." Its tarsus is not only longer, but also thicker in proportion, measuring as it does 84.5 mm. instead of under 79 mm. The bill is thicker and heavier, and the general coloration is darker brown. In our small series of winter specimens from California and Mexico there is none fitting this description; all are by comparison small birds. Another series of twenty-five birds, taken during spring migration in southern Saskatchewan, undeniably average larger than the California birds; some of them, indeed, approximate the larger form in certain measurements, but taken as a whole they seem better referable to the smaller race. My colleague, Dr. Arthur C. Twomey, has examined in addition a good series of breeding birds in other collections (Chicago Museum of Natural History, Chicago Academy of Sciences, Colorado Museum, National Museum of Canada, Conover Collection). These come from various points in northern Alaska, east to Point Barrow. Their measurements agree with those of the winter and migrant examples, so that we can feel reasonably sure that the breeding population of this region is the same (or at least belongs to the same race) as migrates through western Canada and winters from California to the Mississippi Valley and southward into Mexico.

As already said, Kuroda had no European specimens of this goose; his conception of *albifrons* was derived from examination of specimens from eastern Asia, which are not necessarily the same as those from Europe. Alphéraky discusses this point at some length, but ends by declining to recognize any races whatever. But in view of the fact that it was not until 1948 that the discovery was formally announced by Dalgety and Scott that the wintering population of the White-fronted Goose in the British Isles comprised two different races, Alphéraky's opinion need not be taken too seriously. In order to put the newly described race on a sound basis these authors reviewed the taxonomic history of the species. Again the same year Salomonsen went into the case in great detail, in support of the validity of the new race, whose breeding grounds had been ascertained to lie in western Greenland. But none of these authorities presumed to question the allocation of the smaller American race with true *albifrons*. On the contrary, Dalgety and Scott expressly stated that "the American *A. a. albifrons* cannot be distinguished, so far as known, from European and Asiatic *A. a. albifrons*, either by measurement, plumage, bill colour or weight." Salomonsen was similarly explicit.

Now, as it happens, the Carnegie Museum has a small but illuminating series of twelve European specimens of true *albifrons*. Eight of these come from Austria, Montenegro, and Albania, and they may be justly regarded as virtually topotypical of this race. Four (mounted birds) are from Holland; like the others they are winter-taken, but they differ in the darker, browner coloration of their upper parts and wings and in the more brownish suffusion of the neck and under parts generally. The significance of this variation I do not presume to explain beyond suggesting that, since it cannot be seasonal, it could be racial. The two groups agree, however, in their relatively smaller size; they are noticeably smaller than our American specimens, and on this ground alone the latter would be subspecifically separable. Leaving the Holland specimens out of account, and taking only those from Austria and the Balkan States as typical of *albifrons* (a perfectly justifiable procedure), and comparing them with winter specimens from California and Mexico, a marked and constant color-difference emerges. The European birds (both adult and immature) are decidedly grayish or slaty above; the

American birds, on the other hand, are just as decidedly brownish in tone. The difference is especially well marked on the wings and their coverts, which latter are pale mouse gray in the European birds, but hair brown in the American. The color of the lower back and rump differs in the two series in a corresponding way: in the one it is mouse gray; in the other, chaetura drab. The amount of black blotching on the under parts varies in both series, but the ground color in the European birds is almost white, while in the American birds it is strongly shaded with brown, and the throats and necks of the latter are markedly browner (near buffy brown of Ridgway, but duller). My first impression was that the American birds, although seasonally comparable with those from Europe, were actually in a different stage of plumage, but further study convinces me that such can scarcely be the case. Immature specimens show precisely similar differences, and what is more to the point, our series of spring specimens taken on migration are undeniably of the brownish type.

From these considerations it follows that we are no longer justified in referring the smaller of the two American races of this goose to true *albifrons* of Europe. Recognition of this fact has been obscured because topotypical European material has not heretofore been available for comparison. The odd distribution resulting from the failure to separate a small American race from the Old World bird seems to have escaped comment. I do not at the moment recall a parallel case of distribution. If the smaller American bird is not *albifrons*, what name should it then bear? Ruling out the *gambeli* of Hartlaub, which applies to another and different form entirely, there is only one other name based on the American White-fronted Goose. This is the *Anser frontalis* of Baird (1858), based on two immature birds, one from "Selkirk settlement" (Canada), the other from Fort Thorn, New Mexico. The latter specimen, still extant in the collection of the Philadelphia Academy of Natural Sciences, was marked "Type" by Cassin (*cf.* Stone, 1900:23). This specimen I have not seen, but the measurements Baird gives point unmistakably to the smaller of the two American forms of the White-fronted Goose. Consequently, I believe this should now stand as *Anser albifrons frontalis* Baird.

As to the subspecific identity of the White-fronted Goose of eastern Asia I cannot say, as I have seen no specimens, but I strongly suspect that it will prove to be the same. Alphéraky's list of measurements indicates that eastern Asiatic specimens tend to be larger than European birds. The breeding population of Alaska might very well migrate southward along both coasts of the Pacific.

Of the larger form I have examined only one adult and two immature examples from the Mackenzie Delta, collected by Dr. Twomey in the season of 1942. Their measurements compare favorably with those of the two individuals from the Arctic coast cited by Kuroda, and with those of winter specimens from California. The adult bird is moulting the wings, but it is remarkable for its large bill, heavy tarsus, and brownish coloration, as compared with Saskatchewan spring birds.

Coming now to the question of what name this large form should bear, it becomes necessary to re-examine Hartlaub's original description of his "*Anser Gambelli*" (1852). Swarth and Bryant reproduce this description, as also does Kuroda; the latter author adds in brackets the metric equivalents of Hartlaub's measurements. However, he is quite unable to reconcile these measurements with his own of the supposed type series in the Berlin Museum, and he suggests that the latter may not be the actual types. But it evidently never occurred to him to check Hartlaub's figures for *albifrons* against the measurements of specimens of that race. Moreover, he assumed (as probably did also Swarth and Bryant) that Hartlaub's measurements were in English inches and twelfths of an inch ("lines"), and gave the metric equivalents accordingly. As a matter of fact, however, Hartlaub was accustomed to use the French inch ("Pied du Roi"), which is

somewhat longer than the English unit of the same name (*cf.* Ridgway, 1886, pl. 17). The proper millimetric equivalents for his measurements are as follows:

	A. gambeli	*A. albifrons*
Length of bill from forehead	63	43
Length of bill from gape	66	47.5
Height of sides of bill	31	24
Length of tarsus	78	58.5
Middle toe	77	70

With this correction made, it will be noted that the figures for *albifrons* correspond very well with my own measurements of our European specimens of that race, also with the measurements given by Alphéraky, and more recently by Dalgety and Scott, and by Salomonsen. By analogy, the figures for *gambeli* should be equally accurate, and so they prove to be upon comparison. The discrepancy between Hartlaub's figures and the actual measurements of his alleged types is thus even greater than Kuroda indicated, because of the difference in the respective units of measurement. Under the circumstances there can be no valid reason for further doubting the pertinence of Hartlaub's name *gambeli* on the basis of his original description, but there also can be no question that the specimens in the Berlin Museum purporting to be his types are not the types at all.

The summer range of this form is still imperfectly known. Preble (1908:302) lists the references known to him, but since at that time the entire breeding population in Arctic Canada was supposed to be *gambeli*, all these records require re-examination. Unfortunately, breeding specimens are still few in number. Such as there are, however, indicate a breeding range extending along the Arctic coast from the Mackenzie Delta east to Repulse Bay, and inland for an indefinite distance. Kortwright (1942:124) recounts the discovery of a breeding colony near the Perry River, south of Queen Maud Gulf, in 1941, by Angus Gavin. Curiously enough, Gavin "also found a nesting colony of the smaller White-fronted Geese about six miles away from the nesting Tule Geese, and states that the two varieties of White-fronts kept strictly apart. A specimen of the large Tule Goose and of the smaller White-fronted Goose were shot." These observations, if confirmed, would go to show that the differences between the two forms are more fundamental than we had supposed—that they are in fact specific and not racial.

The winter range of the large form is also a matter for further investigation. It appears that a certain proportion of the breeding population follows the same route as their neighbors the Ross Goose, and find their way to California, as we learn from Swarth and Bryant and other authorities. But others apparently follow a more direct route to the Gulf coast. One of the implied arguments against the acceptance of the name *gambeli* has been that it was described from "Texas," where it was not known to occur. I cannot at this writing lay my hand on a Texas record supported by a specimen, but Oberholser (1938:89-91) claims that this form is the only one occurring in winter in Louisiana; so I consider it entirely possible that it occurs in Texas, also. The allocation of White-fronted Goose records in the eastern United States will have to be settled by actual examination of specimens. One thing appears fairly certain, however, and that is that the total population of this larger form is much smaller than is that of the smaller kind.

Referring to the "nomenclatorical tangle" outlined by McAtee (1944), and based on the erroneous spelling of the patronymic name by Hartlaub ("*Gambelli*"), I think that this is rather a nomenclatorial quibble. Unhesitatingly, I contend that this spelling is a slip of the pen or a typographical error, and should be corrected, the "one-letter rule" of the Code to the contrary notwithstanding. Accordingly, I believe that the American races of the White-fronted Goose should stand as follows:

Anser albifrons flavirostris Dalgety and Scott, Bull. Brit. Ornith. Club, 68, No. 6, May 7, 1948 (North Slab, Wexford, Eire). Breeds in western Greenland; winters in the British Isles; casual or accidental in eastern North America.

Anser albifrons gambeli Hartlaub, Rev. et Mag. Zool., (2), 4, 1852, 7 ("Texas et l'un du sud de l'Amérique du nord" = Texas). Breeds along the Arctic coast, from the Mackenzie Delta east to Repulse Bay, and inland for an indefinite distance; winters on the Gulf coast of Louisiana and Texas, also in California. Migration route imperfectly known.

Anser albifrons frontalis Baird, in Baird, Cassin, and Lawrence, Rep. Expl. and Surv. R. R. Pacific, 9, 1858, 762 ("Selkirk settlement and Fort Thorn" [New Mexico] = Fort Thorn). Breeds in Alaska (probably also in the District of Mackenzie); winters in the western United States and south to Central Mexico.

MEASUREMENTS OF ADULTS

Carnegie Museum No.	Sex	Locality	Wing	Tail	Exposed culmen	Height of bill	Tarsus
Anser albifrons albifrons:							
10791	♀	Bergen-op-Zoom, Holland	402	122	43	23.5	57
10792	♀	Leiden, Holland	392	123	42	24	58.5
10793	♂	Leiden, Holland	393	118	46	26.8	60.2
108245	♂	Petronell, Austria	390	113	42	24	65
108246	♀	Petronell, Austria	385	112	43	24	62
108247	♀	Petronell, Austria	403	112.5	47	24	60
112699	♂	Crni Zar, Albania	402	125	44.8	24.9	63.8
Anser albifrons frontalis:							
4852	♂	La Barca, Jalisco, Mexico	442	137	48	26	70
21692	♂	Emporia, Kansas	398	123	49.5	27	70
36065	♀	Merced Co., California	398	123	47	27	67
36066	♂	Merced Co., California	417	126	48	26	70
36080	♂	Merced Co., California	415	124	49.3	25.5	66
107046	♂	West Butte, California	423	123	53	25.5	73.5
111459	♀	Pennington, California	412	121	49	23.5	65
111879	♀	Last Mt. Lake, Sask.	432	129	55	26.4	75
111880	♀	Last Mt. Lake, Sask.	426	128.8	55.5	28	75.2
111881	♂	Last Mt. Lake, Sask.	435	130	51	28	71
111883	♂	Last Mt. Lake, Sask.	415	114.5	52	25.9	62
111884	♀	Last Mt. Lake, Sask.	396	124	47.5	25	63
111899	♀	Last Mt. Lake, Sask.	425	124	50.5	26.5	66
111900	♀	Last Mt. Lake, Sask.	420	126	47.8	22.6	68
111902	♂	Last Mt. Lake, Sask.	430	123.5	55	27.3	73
111905	♂	Last Mt. Lake, Sask.	445	133	53	26.5	75.5
111916	♂	Last Mt. Lake, Sask.	——	125	53.3	29	76
111917	♂	Last Mt. Lake, Sask.	420	123	57	28.6	69.2
111918	♂	Last Mt. Lake, Sask.	445	139	55	28.5	69.5
111949	♂	Last Mt. Lake, Sask.	425	125	56	28	70
111950	♂	Last Mt. Lake, Sask.	425	132	57	29	73
119312	♂	The Pas, Manitoba	415	126.5	49.8	26	69.8
119313	♂	The Pas, Manitoba	420	130	53	29	70.5
Anser albifrons gambeli:							
129536		Loon Channel, NW. Terr.	.....	121.5	60	28	77

ACKNOWLEDGMENTS

The author is indebted to Dr. Twomey for permission to transcribe specimen measurements which he had prepared for use in another connection. If there seem to be discrepancies and inconsistencies between his figures and those of other authors, it may safely be laid to different methods of measuring. Also, the author is under obligation to his friend K. H. Jacobsen, of Beaver, Pennsylvania, for a full and accurate English translation of Salomonsen's article above quoted.

LITERATURE CITED

Alphéraky, S.
1905. The geese of Europe and Asia (London, Ward).
Baird, S. F., Cassin, J., and Lawrence, G. N.
1858. Reports of explorations and surveys . . . for a railroad . . . to the Pacific Ocean. Volume 9, part 2. Birds (Washington, D.C.).
Dalgety, C. F., and Scott, P.
1948. A new race of the White-fronted Goose. Bull. Brit. Ornith. Club, 68:109-121.
Hartlaub, G.
1852. Descriptions de quelques nouvelles espèces d'oiseaux. Revue et Magasin de Zoologie, 2nd series, 4:1-7.
Kortwright, F. H.
1942. The ducks, geese and swans of North America (Washington, American Wildlife Institute).
Kuroda, N.
1929. On the subspecific validity of *Anser gambelli* Hartlaub. Condor, 31:173-180.
McAtee, W. L.
1944. *Anser gambelli*. Auk, 61:294-295.
Oberholser, H. C.
1938. The bird life of Louisiana (New Orleans, Dept. of Conservation).
Preble, E. A.
1908. A biological investigation of the Athabaska-Mackenzie Region. North Amer. Fauna No. 27:1-574.
Salomonsen, F.
1948. Blisgaasen (*Anser albifrons* (Scop.)) og dens Slaegtninge. Dansk Ornith. Forenings Tidsskrift, 42:102-108.
Salvadori, T.
1895. Catalogue of the birds in the British Museum. Vol. 27, Chenomorphae, Crypturi, and Ratitae (London, British Museum).
Scopoli, G. A.
1769. Annus I, Historico-Naturalis (Lipsiae; not examined.)
Stone, W.
1899. A study of the type specimens of birds in the collection of the Academy of Natural Sciences of Philadelphia, with a brief history of the collection. Proc. Acad. Nat. Sci. Phila., 1899:5-62.
Swarth, H. S., and Bryant, H. C.
1917. A study of the races of the White-fronted Goose (*Anser albifrons*) occurring in California. Univ. Calif. Pub. Zool., 17:209-222.

Carnegie Museum, Pittsburgh, Pennsylvania, November 5, 1949.

A MIOCENE FLAMINGO FROM CALIFORNIA

By LOYE MILLER

The novitiate amateur in ornithology today takes great delight in listing his "firsts" among field acquaintances. And perhaps he is in a measure justified because it is the "first" that fixes the peg upon which he can hang all the subsequent and, we hope, oft-repeated contacts that eventually grow into real understanding.

The "first" has to come first in avian paleontology likewise and, sad to relate, that first may be restricted to a single bone or a mere fragment thereof. A single specimen from a single locality may seem to the bird watcher to be of little import in the over-all picture of ornithology. It does not sing. It has no charm of color or delicacy of shading in its plumage. There is no hint of sprightliness, no mastery of invisible air current, no influence on the farmer's crop or his insect competitor for that crop. It is nevertheless a thing of significance.

The science of avian paleontology has today reached a point where, despite the fascination of firsts, we are almost as eagerly looking for seconds, thirds, and fourths. What is more, we are finding them. Parts of the structure are beginning to take on a revealing shape. The subject of this report is a "second" for one genus and it is a "multiple" in the history of a highly specialized family—the birds we know today as the flamingos.

Alden H. Miller (1944) reported a new genus of primitive flamingo from the Lower Miocene of South Dakota, *Megapaloelodus connectens*. His diagnosis is unchallenged and his deductions are logical. The name chosen indicates great size as compared with *Paloelodus goliath* from the Oligocene of France (Milne-Edwards, 1867-1871:58). The specific name *connectens* indicates the describer's feeling that the species tends to bridge the gap between *Paloelodus* and *Phoenicopterus*, our only surviving genus of the family of the flamingos.

Only a small fragment of the tarsometatarsus and a badly crushed femur were taken from the South Dakota quarry (Flint Hill, Bennett County) which lies in the upper part of the so-called Rosebud Formation, correlated as late Arikaree. Now there comes in from Barstow, California, a tibial fragment of Upper Miocene age, separated in both time and space by a very sizable hiatus from the South Dakota specimens. But despite the fact that a different element of the skeleton is represented, the California specimen is here assigned to the species that was established for the South Dakota bird. Both authors who have studied remains of *Megapaloelodus* lean rather heavily upon a paraphrase of an old axiom: "Things that differ in the same way from the same thing do not differ from each other." The first author placed a tarsus and a femur in his newly established genus and species because of their comparable divergence from the Oligocene *Paloelodus* of France. The present author by similar reasoning and a similar comparison with the abundant French material assigns the California tibia to the species established for the South Dakota tarsus and femur.

The assignment is necessarily tentative in view of the wide separation of the two sources of material, but this course of action seems better than to establish entirely new taxonomic categories. It is true that certain characters of the California specimen seem to indicate higher specialization than either *Paloelodus* or *Phoenicopterus* and more complete representation may some day come to light with the result that revision may be demanded.

The California representation of *Megapaloelodus connectens* consists of the distal end of the tibiotarsus, no. 2303, and the distal end of the ulna, no. 2303A., Miller Col-

lection, University of California, Los Angeles. It is derived from the Barstow Syncline, Upper Miocene. The specimens are the generous gift of Richard H. Tedford and Robert L. Shultz.

Tibiotarsus. After careful comparison with recent specimens of *Otis, Anhima, Cariama, Grus, Phoenicopterus* and a variety of other and more remote forms, the fossil was assigned to the family Phoenicopteridae although there were certain marked departures from the typical genus *Phoenicopterus.* Confirmation of that assignment came after a conference with Dr. Alden H. Miller and a study of Milne-Edwards' beautiful lithographs of the Oligocene *Paloelodus* of France (*op. cit.*).

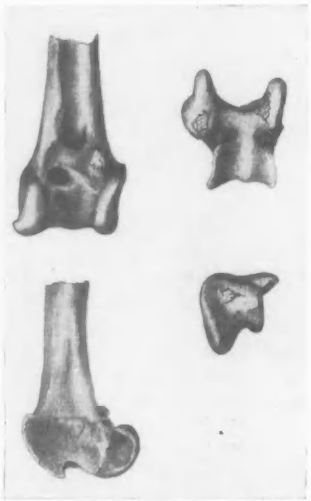

Fig. 16. *Megapaloelodus connectens* from Barstow, California. Natural size. Drawings by the author.
Upper left, left tibiotarsus, no. 2303, front view.
Upper right, tibiotarsus, end view.
Lower left, tibiotarsus, side view.
Lower right, right ulna, no. 2303A, end view.

Comparison is here made with the recent *Phoenicopterus ruber.* Front or ventral aspect (see fig. 16): The two bones are almost equal in size. The condyles appear much the same in both but the transverse profile of the notch between the condyles is different. In the fossil this transverse line is almost at right angles to the sagittal plane of the shaft, there being only a slight rise near the external condyle. In the Recent bird the inclination is in the opposite direction and the whole intercondylar profile is much more deeply notched, which means that the condyles of the living flamingo must fit into deeper cotylar basins in the tarsal head than in the fossil species.

The supratendinal bridge in the fossil overlies a larger tunnel with more rounded distal opening and a less oblique proximal border; the intercondylar tubercle is simpler,

smaller, and is placed far over toward the external profile of the bone. The inner end of the supratendinal bridge is so depressed that it is separated from the inner border of the shaft by a distinct furrow. The intercondylar fossa is deeper and extends laterally until the inner condyle becomes excavated at the back side to a degree I have seen in no other bird. The significance of this character is difficult to postulate.

Unfortunately the shaft of the bone is broken off at a point about 15 mm. above the supratendinal bridge. Up to that point, however, it is more deeply and more abruptly furrowed; the internal ridge is sharp but the external ridge is gently rounded. Running up the shaft from the internal end of the bridge, is a very pronounced scar for the attachment of the internal end of the ligamentous bridge which overlies the osseous bridge. The outer end of this ligamentous bridge seems to have been anchored to the conical intercondylar tubercle since no other attachment is evident. In *Phoenicopterus, Grus,* and *Cariama* there is a definite, raised ridge for attachment of the external end of this ligament. The California fossil resembles the French *Paloelodus* in this respect.

Internal view: When viewed from this aspect, the fossil displays one of its most striking characters. The distal profile of the internal condyle in so many birds displays a fairly smooth curve from front to rear of the bone. Among the "straight-legged" forms which spend much of their time with the tibia and tarsus in almost perfect alignment, there is a tendency toward a flattening of this curve. In *Grus* there appears a barely perceptible indentation about midway of the curve; in *Cariama* the indentation is more marked but in the fossil specimen this character reaches an extreme such as is to be seen in no other group of birds. A deep, rounded notch in the profile is limited at its posterior border by a hook-like process fully two millimeters in length! This notch communicated with a well defined fossa on the terminal articular face of the bone, which is approached from the external side by a corresponding and only slightly less profound fossa.

A comparable notch is indicated on the external trochlear profile but unfortunately a slight local fracture has obliterated most of the corresponding process which seems to have existed there during the life of the individual. What may be the function of these notches is not quite certain; it may be to harbor powerful articular ligaments that would tend to strengthen the intratarsal joint when in the position of complete extension. As one of my colleagues suggested, "Perhaps it enabled the bird to lock the joint and sleep more securely in the standing position." There may be something to the idea. The two above-mentioned depressions are found in *Paloelodus* and *Phoenicopterus* but are not evident in *Cariama* or *Grus*.

Distal view: When viewed from this aspect, the fossil displays two characters which are not found in the Recent flamingo but which do appear in *Paloelodus* of France. The posterior intercondylar sulcus is divided into two parallel furrows by a low, rounded median ridge; *Grus* has this character to a slight degree and *Cariama* has but a suggestion of it. It is wanting in *Phoenicopterus*.

The second distinctive character results from a pronounced widening of the internal condyle at a point directly below the ligamental prominence. The effect of this lateral widening is greatly to increase the surface of contact between tibia and tarsus while the bird is standing erect. It gives the internal condyle a peculiar, inflated appearance when the tibia is viewed from the distal end. *Grus* has this expansion developed on the opposite condyle but it is less abruptly produced. *Phoenicopterus* does not show it on either condyle.

In size, the South Dakota tarsus and the California tibia are very nearly the same as the corresponding bones of a large male specimen of *Phoenicopterus antiquorum*, no. 1892, in the Miller Collection of Osteology at the University of California, Los Angeles.

	Flamingo no. 1892	South Dakota fossil
Tarsometatarsus (trochleae only)		
Maximum transverse diameter	21.0 mm.	21.3 mm.
Maximum sagittal diameter	19.7	22.5
	Flamingo no. 1892	California fossil
Tibiotarsus (distal end only)		
Maximum transverse diameter	17.4	17.0
Maximum sagittal diameter	19.7	18.8

Associated material.—The distal end of an ulna was taken from the same locality as the tibiotarsus here discussed and less than a yard removed therefrom. The specimen is not as well preserved as the tibia and displays less definite characters. It does seem to be phoenicopterid in its affinities, however, and the size would suggest that it might have come from the same individual. Further excavation at the site failed to uncover any other parts of the skeleton.

The specimen (figure 16) differs from the Recent flamingos and cranes in its very large carpal tuberosity which is flattened on its radial side, is set off on its distal side by a deeper, more rounded notch, and is located in a more proximal position. No traces of papillae for the secondaries are evident along the shaft. Their absence may, however, be the result of post-mortem deterioration.

The Barstow locality has been the scene of paleontologic "hunting" for a period in excess of forty years. Both professionals and amateurs have represented a variety of interests from the serious studies by large universities and museums to the casual wanderings of tourists and of enlisted men from a nearby military base. It remained for a pair of enthusiastic young amateurs, Richard Tedford and Robert Shultz, to discover and partly explore the first lacustrine bird-bearing locality, sandwiched as a broad, thin lens between thick layers of the general tuffaceous accumulation that makes up the main mass of the Barstow Syncline.

I quote from Tedford's notes as follows:

Locality V492. Middle of SE¼, NW¼, Sec. 15, T 11 N. R2W. San Bernardino base line and meridian, Searles Lake Quadrangle.

The lacustrine lens here described is exposed in the south limb of the Barstow Syncline near the west end of the exposure and is composed of finely weathering buff to grayish-brown clays interbedded with calcareous layers of one to three inches thickness, the calcareous layers being confined to the lower two thirds of the section. Freshwater gastropods and land mammals were found only in the upper one-third of the section consisting of pure clay and varying from one half to one foot in thickness . . . . The lacustrine beds are traceable for about 900 ft. along their exposed edge which extends in an approximately east and west direction . . . . and are about four feet in thickness. Associated mammals include *Merychippus, Hypohippus, Procamelus, Merycodus,* mastodont, *Tomarctus.*

In a paper describing *Phoenicopterus stocki* from the Pliocene of Chihuahua (L. Miller, 1944) the following suggestion was made. "The African bird is especially abundant about the bitter waters of the African plateau country. *P. ruber* is partial to those 'half islands' in the Carribean area, where water and mud are scarcely differentiated, and to the saline crater lakes of the Galápagos Islands. The Chilean bird finds in the semi-desert of Argentina, Chile, and Patagonia, the same salt-pan environment . . . . Is it not justifiable therefore to postulate a comparable environment in Pliocene time at the Rincón locality of Chihuahua?"

Chapman (1908:153) states that a large factor in the diet of the flamingo on the Bahama swash is a small mollusk *Cerithium,* the shells of which are completely reduced by the bird's digestive processes. It has even been intimated by him that the shells con-

stitute a vital factor in the normal metabolism of the flamingos. Associated with *Megapaloelodus* in the lacustrine matrix at Barstow there occur the abundant shells of small snail-like mollusks of two or three species not yet precisely determined. Merriam (1919: 450) mentions *Planorbis, Limnaea,* and *Anodonta* in his tabulation of the fauna but does not designate the exact locality from which they were obtained. His only comment is that "the section in the Barstow syncline consists in large part of volcanic materials with beds of clay and shale at some horizons. The deposits are evidently partly of terrestrial and partly of lacustrine origin. At rare horizons, remains of fresh water mollusca including *Planorbis* and *Anodonta*(?) are abundant. In other beds scattered and weathered bones, representing a large tortoise and numerous mammals belonging to the open plains type probably indicate accumulation on dry land." It would seem that we are here dealing with one of these lacustrine lenses in the greater subaerial accumulation. It was apparently a small, shallow and ephemeral body of water in which sedimentation took place, for the lens is thin and it diminishes gradually to its margins. It is overlaid by the same type of rock as that upon which it rests. Whether or not its waters were entirely fresh is not known, but careful search revealed no deposits of gypsum, borax or soluble salts. The presence of calcareous layers interbedded with the clays would, however, suggest cycles of time greater than annual cycles during which the lake waters were highly concentrated. More soluble matter may have been leached away during subsequent geologic periods. It is possible therefore that the Miocene lake may have contained salts not preserved to us in Recent time. On the other hand, Merriam postulates a more abundant rainfall than is normal in Barstow today. In the Lower Pliocene beds (Ricardo) to the westward there occur the petrified stems of palms and of broad-leaved trees (*Robinia*). Furthermore, imprints of palm leaves were found at Barstow by Tedford and Shultz. Quite certainly the present mountain barrier which cuts off the moisture laden winds from the south coastal area was either much lower or even non-existent. Still the area was pretty well removed from the sea and there is no assurance that there did not occur at times the bitter lake environment that seems to attract the modern flamingos.

Megapaloelodus, although presumably less specialized in beak structure than *Phoenicopterus,* would thus fit well into the picture that the imagination reconstructs of the Miocene landscape at Barstow.

LITERATURE CITED

Chapman, F. M.
1908. Camps and cruises of an American ornithologist (New York, D. Appleton and Company).
Merriam, J. C.
1919. Tertiary mammalian faunas of the Mohave Desert. Univ. Calif. Publ. Bull. Dept. Geol. Sci., 11:437-585.
Milne-Edwards, A.
1867-1871. Recherches anatomiques et paléontologiques pour servir a l'histoire des oiseaux fossiles de la France (Paris, G. Masson).
Miller, A. H.
1944. An avifauna from the Lower Miocene of South Dakota. Univ. Calif. Publ. Bull. Dept. Geol. Sci., 27:85-100.
Miller, L.
1944. A Pliocene flamingo from Mexico. Wilson Bull., 56:77-82.

University of California, Los Angeles, California, August 5, 1949.

NOTES ON THE SWALLOW-WING, CHELIDOPTERA TENEBROSA, IN SURINAM

By FR. HAVERSCHMIDT

Recently Skutch (Wilson Bull., 60, 1948:81-97) published an important article on the life history of certain puff-birds in which the Swallow-wing (*Chelidoptera tenebrosa*, family Bucconidae) is mentioned briefly. As this is a common bird in Surinam, Dutch Guiana, the following supplementary notes may be of interest.

Habitat.—The Swallow-wing seems to be confined to sandy ground, as only in this type of soil is it able to excavate its nesting burrows. In the coastal area of this country it is for this reason confined to the sand reefs which frequently contain layers of sea shells and their remnants and which are to be regarded as old natural sea walls. These sand reefs invade the clay land of the coastal area in successive rows, mostly parallel to each other and more or less parallel to the present coast line. The width of one sand reef varies from 25 to more than 100 yards, while its length varies from one to more than 10 miles. The reefs are covered with dense vegetation. Swallow-wings are usually seen in this type of land perched on the very tops of tall trees.

On these sand ridges Swallow-wings and other kinds of birds are found which are also characteristic of the dry sandy savannas of the interior. There the Swallow-wings are more common and also easier to observe. In the breeding season their optimum habitat seems to consist of small sandy savannas with scattered shrubs and low trees surrounded on all sides by forest, the distance to which must be short. Birds breeding in this habitat are the ground-nesting *Colinus cristatus* and *Myiospiza humeralis* and the tree-nesting *Tangara cayana, Schistochlamys melanopis* and *Empidonomus varius*. I never found the Swallow-wing on wide open savannas with only low vegetation.

The Swallow-wing has also adapted itself more or less to civilization, as it is common all along the part of the railway which runs south from Paramaribo wherever it is enclosed by forest. Here the birds nest in the embankment of the railway and are often seen perched on the telephone line along it.

Behavior.—The Swallow-wing is a quiet bird which sits for long periods in the top of a tree without moving. In flight it looks black with rounded wings, a very short tail and a conspicuous white rump. It feeds in flycatcher fashion in the air and returns to the same perch. Call notes and song are not very striking, but on a few occasions I have heard a twittering song, difficult to describe, which was uttered in flight.

In the breeding season they are rather pugnacious to hawks. I have seen a Swallow-wing harassing *Buteo magnirostris* several times as the latter was sitting in a tree on its breeding grounds looking for prey.

The manner of scratching the head resembles that of other puff-birds, for example, *Notharchus tectus*; that is, the leg is passed under the wing and not over the wing as in passerine birds.

Breeding season.—In the small forest-bordered savannas already mentioned, the breeding season is easily ascertained, as only then do the Swallow-wings leave the forest edge and sit either singly or in small groups of up to eight individuals in the tops of shrubs or low trees dotted over the savanna. Outside the breeding season I have never seen them in these situations. The breeding season in Surinam coincides more or less with the dry seasons. During the rains the nesting burrows would be likely to flood.

In the large Penard oological collection from Surinam, the eggs are dated from September to November and one clutch was taken in March (Hellebrekers, Zool. Mededeelingen, 24, 1942:250). According to my observations the breeding season starts consid-

erably earlier, in July and August, perhaps even in June. On June 24, 1949, I observed a few Swallow-wings on the ground in a savanna near the Zanderij airfield, where I took most of my notes. Their occurrence in this habitat is a reasonably good sign that the birds are nesting. Moreover, I found the beginning of a nesting burrow. On August 1, 1948, I flushed a bird from a burrow, which I did not open, however. On August 21, 1949, I excavated four burrows, which contained, respectively, two eggs, one egg, two still naked young and one fully fledged young on the point of leaving its nest. From the age of this last young, we must conclude that the eggs were already laid in July. Furthermore, I examined, on November 9, 1947, and on November 20, 1949, two burrows which contained two fresh eggs and one small young, respectively. All these data coincide more or less with the long dry season. On the other hand, the nesting season may extend into December, as on December 4, 1949, I opened two burrows containing one fresh egg and one small young bird. This date falls in the short rainy season, which follows the long dry season.

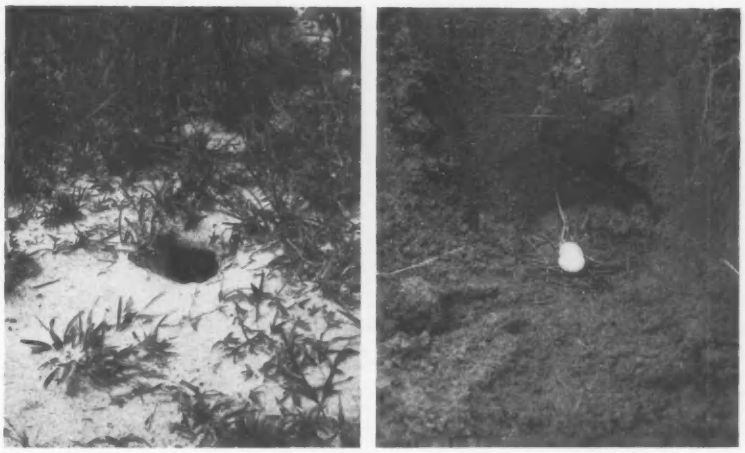

Fig. 17. Left, entrance of nesting burrow of Swallow-wing in level ground at Zanderij, Surinam, August 1, 1948.

Right, nest and eggs in excavated nesting burrow at Zanderij, September 4, 1949.

The March clutch in the Penard collection is from the short dry season. Up to the present, I have not found any Swallow-wings nesting in the locality which I visited regularly in this season. On February 26, 1949, I found the beginning of a nesting burrow, but the birds had gone on March 6. The short dry season of 1949 was, however, unusual because of its heavy rainfall. On the other hand, I observed on April 4, 1949, while driving in a draisine over the railway, several birds flushing from the embankment, a certain sign that they were nesting at that time. It seems possible that there is some local and also seasonal variation in the breeding season.

The nesting burrow.—The great majority of nesting burrows in the area where I have studied Swallow-wings are dug out in level ground. A few, however, are found in the bank of a small sandpit. The birds nest either singly or in small groups of up to four pairs. The entrance of the burrow (fig. 17) has a peculiar and characteristic shape.

It is never circular, its width always being greater than its height. The range of measurements of five entrances taken on August 14, 1949, are: height, 6 to 7.5 centimeters, width 8 to 10 centimeters.

To my regret I have never seen a bird in the act of digging, but on October 14, 1947, I watched a bird, with a piece of dry grass in its bill, running in a rather awkward way on the sand. Cherrie (Mus. Brooklyn Inst. Arts Sci., Sci. Bull., 2, 1916:323-324) correctly remarks that there is no sign of excavated sand at the entrance of the tunnel. I would hesitate to assert that the sand is carried away by the birds when digging. It may be possible that it is trampled down by the birds going in and out or flattened by wind or rain. On the other hand, outside of a burrow in a bank which was not yet finished, when found on August 28, 1949, the traces of the excavated sand falling down were clearly visible.

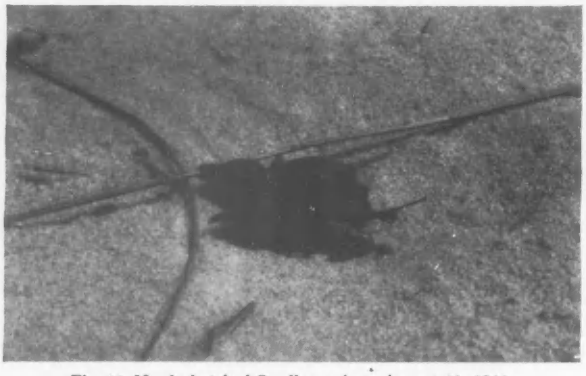

Fig. 18. Newly hatched Swallow-wings, August 21, 1949.

In all the burrows I opened (12 in all) the chamber at the end was lined with a few bits of dry grass on which the eggs were resting (fig. 17). The tunnel itself slopes downward slightly and has a length of 1 to 1.5 meters.

The eggs.—I have never found more than two eggs in a clutch, although the Penard brothers (De Vogels van Guyana, 1908:569-570) assert that sometimes three eggs are laid. This is not corroborated by other authors, nor is there a clutch of three eggs in their collection (Hellebrekers, *loc. cit.*); moreover, I rather doubt the statement as they had no field experience with the species. As there is variation in the measurements of the few eggs collected by me additional to that of the series in the Penard collection, I give here measurements of three sets of two eggs each and of one single egg:

November 9, 1947	24.6 × 20.6 mm.
	24.8 × 19.9
August 24, 1948	26.4 × 19.5
	25.0 × 19.4
September 4, 1949	25.3 × 21.3
	25.0 × 21.0
December 4, 1949	25.5 × 19.7

The weight of one fresh egg was 5.38 grams.

The young.—Newly hatched young are naked and black (fig. 18). Fully fledged young when excavated are very quiet, show a predilection for dark places, and do not try to escape (fig. 19).

Fig. 19. Fully fledged Swallow-wings in excavated nest burrow at Zanderij, September 18, 1949.

The Penard brothers (*loc. cit.*) remark that many burrows are flooded, which is possible, as the dry season in Surinam is not without rain. The young are also exposed to predation by snakes which enter the burrows. In each of two burrows I opened, I found a large toad.

Summary.—The Swallow-wing (*Chelidoptera tenebrosa*) is a common bird in Surinam in areas of sandy ground, especially in the savanna belt. The breeding season coincides more or less with the dry seasons; most nestings occur from July to December, but a few occur in March. The nesting burrows are excavated in level ground and in banks. The nest chamber is lined with a few bits of dry grass. The clutch consists of one or two eggs.

Paramaribo, Surinam, Dutch Guiana, January 3, 1950.

THE GREAT-TAILED GRACKLES OF THE SOUTHWEST

By ALLAN R. PHILLIPS

Since 1913, a general northward invasion of Great-tailed Grackles has taken place in southern Arizona, New Mexico, and adjacent parts of southwestern Texas and northern Mexico. Two distinct races are involved, and the future will probably produce mingling of these races. Ornithologists should make careful observations and collections, especially of females, as this unusual situation develops.

One of the races involved is *Cassidix mexicanus nelsoni* (Ridgway) of Sonora (Phillips, 1940; Huey, 1942); the other has been in doubt. As early as 1934, van Rossem (1934:476) called attention to the small bills of four males from the city of Chihuahua; he had seen no females. Lowery (1938) was likewise handicapped by paucity of specimens from the plateau when he described the bird of the Texas lowlands. Since then, thanks largely to the discriminating collecting of Gale Monson and of A. E. Borell, a number of females have been taken in the upper Rio Grande valley and vicinity. These show that the birds of the northern plateau of Mexico resemble most closely the nominate race and are more distinct from the paler races of the adjacent coastal lowlands. They may be known as

Cassidix mexicanus monsoni, new subspecies

Type.—Adult female, no. 706, collection of Allan R. Phillips, taken near San Antonio, Rio Grande Valley, New Mexico, April 3, 1942, by Gale Monson, field no. 182.

Diagnosis.—A large grackle with dark-plumaged female and with iris broadly straw-white in both sexes; closely similar to *C. m. mexicanus* (Gmelin) of the coastal lowlands of eastern Mexico (type locality Vera Cruz), but with distinctly less massive bill and apparently more slender tarsus. Adult female darker on head and underparts and more constantly brownish on chest than in *C. m. prosopidicola* Lowery (1938), and bill somewhat more slender. A decidedly larger, longer-tailed bird than the now geographically adjacent *C. m. nelsoni* (Ridgway), of central southern Arizona and Sonora (type locality Alamos), with decidedly darker female, the breast and belly in unfaded plumage being dark brownish gray instead of pale brownish buffy.

Range.—Originally, the plateau of central northern Mexico, at least in Chihuahua, in recent years breeding northward to north-central New Mexico and (presumably this race) the Gila Valley in eastern Arizona; ranges east to western Texas (Brewster County) and west to southeastern Arizona (casually to Benson, San Pedro valley, and even to near Randolph, Pinal County). Winters sparingly along the Rio Grande from Juarez, Chihuahua, north to at least the Bosque del Apache refuge near San Antonio, New Mexico, and even in Arizona (Pinal County, and Thatcher, Graham County); main winter range unknown, presumably in southern Chihuahua.

Age differences in males appear more pronounced in *Cassidix* than are the slight differences between races and species. My comparisons were made, therefore, principally with females. While age differences in females are less obvious, they seem to be of some importance also. Study of the series of female *monsoni* indicates that adults may often be distinguished (up to May or June) by their more steel-blue, iridescent wing-edgings and coverts, broader rectrices and remiges and primary coverts (particularly the proximal webs of the latter, which are also dark to their tips), and darker coloration below on sides, flanks, tibia, malar region, and cheeks; they have less pronounced pale superciliary stripes and sometimes even an admixture of dusky in the throat and under parts. They show less feather wear (month for month) than do first-year females, and their ovaries enlarge earlier. I did not succeed in determining the age of all of the female *monsoni* examined, however, and autumn females of known age are badly needed. With males there is no difficulty in determining age, as adults are more iridescent on the breast, sides, anterior flanks, and back, the feathers of these parts having broad pur-

plish edgings; adults also have more iridescent (bluish) rump and tail, broader and more rounded rectrices and tertials, and distinctly blacker (less brownish) tibial feathering than do young birds, and they are larger.

Measurements of Races of *Cassidix mexicanus* in Millimeters

	Length (flesh)	Wing (chord)	Tail	Bill from nostril	Depth of bill at nostril
		Females			
4 adult *monsoni*	360±-362	147.0-151.5 (148.4)	157.6-165.0 (161.1)	24.1-26.2 (24.9)	9.6-10.5 (10.0)
6 first-year *monsoni*	339-343	140.0-146.3 (143.2)	140.2-151+ (146.5)	23.3-25.4 (24.4)	9.7-10.6 (10.0)
8 *prosopidicola*	355-374	141.4-149.6 (146.3)	135.0-155.8 (142.9)	22.3-26.9 (24.3)*	10.0-11.0 (10.6)*
9 *mexicanus*		142.3-154.5 (148.3)	138.3-158.0 (148.7)	24.0-28.5 (25.9)†	10.7-11.6 (11.1)†
12 *nelsoni*	317+-324+; 338	124.2-140.0 (132.5)	116+-134.0 (124.2)	20.9-27.4 (23.0)	8.5-11.1 (9.6)
		Males			
3 adult *monsoni*	473	186.4-192.0 (188.6)	217.0-225.0 (219.8)	31.8-34.8 (33.5)	12.5-12.9 (12.7)
6 first-year *monsoni*	425-426+	174.0-179.5 (177.0)	176.5-200.5 (191.5)	28.6-32.6 (30.8)	11.8-12.6 (12.2)
2 adult *nelsoni*	391	164.3-177.8 (171.0)	166.0-185+ (175.5)	29.1-31.5 (30.3)	11.6-11.7 (11.6)
5 first-year *nelsoni*	365+-392	160+-167.5 (163.3)	142+-163.0 (153+)	25.6-28.5 (27.0)	11.4-12.1 (11.7)

*18 specimens.
†10 specimens.
For additional measurements of *mexicanus* and *prosopidicola* see Lowery (1938).

It will be noted that the relatively long tail and dark female of *monsoni* are in distinct contrast to the clines toward small size and pallor toward the north along both coasts of Mexico.

The eastern limits of *monsoni* are not clear, as no birds from the Pecos valley have been examined. Old specimens from Fort Clark, Texas, and eastward are *prosopidicola*. To the west, while no *monsoni* have yet been taken near Tucson, a female taken there on January 31, 1945, closely resembles *C. m. graysoni* except for its slender bill; it is probably an intergrade between *nelsoni* and *monsoni*. To the south, the range of *monsoni* is apparently quite restricted. A female from Las Delicias, southern Coahuila, while very worn, is almost as pale as *nelsoni*; it is very close to *prosopidicola*, although a little large, long-tailed, and perhaps a bit paler. Two females from San Luis Potosí in the Sanford collection are also pale but are very small and short-tailed. If these are really *prosopidicola*, the range of that race is almost or entirely divided by the tongue of *mexicanus* that now extends north to at least Linares, Nuevo León. Indeed, a female from 20 miles north of Monterrey, while nearest *prosopidicola*, is darker and browner than average, thus approaching either *mexicanus* or *monsoni*.

The range currently ascribed to *C. m. mexicanus* seems to be too large. Three females from Guatemala (Panajachel and Finca Carolina) are only slightly browner than *prosopidicola*, being decidedly paler than birds from the eastern lowlands of Mexico. Inland, *mexicanus* appears to reach the edge of San Luis Potosí (Tamazunchale), al-

though a female collected there is somewhat faded and paler than average. Likewise a female from the Río Sabinas, southern Tamaulipas, seems to me best referred to *mexicanus*, although somewhat faded. These last two specimens were both taken in April, and their intermediate characters have already been noted by Sutton and Pettingill (1942).

Fig. 20. Distribution of grackles in the Southwest. Year of first known record is given for each locality. Years in parentheses are records of straggling pioneers. Where year is given as 1932-3 or 1946-7, first record was made in winter rather than in summer. Circles denote doubt as to race present. Broken line indicates present boundary between races.

The northward movement of various grackles in recent years seems to be affecting *C. m. mexicanus* also. All specimens of that race examined from north of the Tamesi River, southernmost Tamaulipas, are recently taken, and Dr. Van Tyne has kindly called my attention to a peculiar female (no. 60356, Univ. Mich. Mus. Zool.) taken in Cameron County, Texas, January 4, 1927, by G. S. Wing. This bird is even browner than average *mexicanus* and is altogether too dark for *prosopidicola*. Its measurements,

too, agree closely with *mexicanus* except for an unusually short and stubby bill, and I judge it to be a straggler or pioneer from the south.

The range of *C. m. mexicanus* would thus appear to be restricted to the lowlands of eastern Mexico, from southern Nuevo León and southern Tamaulipas south at least to Chinchorro Bank, Quintana Roo; it has extended north (casually?) in recent years to the southern tip of Texas.

It is a pleasure to acknowledge the helpful cooperation in the use of specimens and information from the authorities of the American Museum of Natural History, United States National Museum, United States Fish and Wildlife Service, University of Michigan Museum of Zoology, University of Arizona, and the Fuertes Memorial Collection of Cornell University, and from A. E. Borell, Lyndon L. Hargrave, C. A. Harwell, Gale Monson, Warren M. Pulich, Dr. L. C. Sanford, A. J. van Rossem, and Dr. J. Van Tyne. Single specimens were also borrowed from the collections of Dr. Herbert Brandt, the Carnegie Museum, the Museum of Comparative Zoology, and the Museum of Vertebrate Zoology, to the authorities of which I am likewise indebted.

LITERATURE CITED

Huey, L. M.
1942. A vertebrate faunal survey of the Organ Pipe Cactus National Monument, Arizona. Trans. San Diego Soc. Nat. Hist., 9:353-376.

Lowery, G. H., Jr.
1938. A new grackle of the *Cassidix mexicanus* group. Occas. Papers Mus. Zool. Louisiana State Univ., 1:1-11.

Phillips, A. R.
1940. Two new breeding birds for the United States. Auk, 57:117-118, 258.

Sutton, G. M., and Pettingill, O. S., Jr.
1942. Birds of the Gomez Farias region, southwestern Tamaulipas. Auk, 59:1-34.

van Rossem, A. J.
1934. Critical Notes on Middle American Birds. Bull. Mus. Comp. Zool., 77:387-490.

Museum of Northern Arizona, Flagstaff, Arizona, August 8, 1949.

FURTHER RECORDS OF THE BIRDS OF THE KETTLEMAN HILLS AREA, CALIFORNIA

By IDA DEMAY WILSON

In the four years since the publication of a report on the birds of the Kettleman Hills area (Wilson, Condor, 47, 1945:149-153), the number of species on the list for the area has increased from 66 to 103. Also continued observations have given a clearer idea of the status of some of the birds that occur here, and there has been opportunity to note some of the changes brought about by several unusually dry and cold seasons. During the winter of 1948-49 the hills were more barren of vegetation than at any time within the six and a half years covered by my records. This means that natural food is scarce, and there has been a consequent decrease in the numbers of birds and mammals seen. In the course of a drive through the hills several years ago we used to see quite a few ground squirrels, cottontails, jackrabbits, Ravens, Loggerhead Shrikes, California Quail, House Finches, Mourning Doves, Western Meadowlarks, and Red-tailed Hawks. Now we may see only one or two Ravens and Loggerhead Shrikes. In our yard we have noticed especially the decrease in numbers of Arkansas Goldfinches, Audubon Warblers, Ruby-crowned Kinglets, and Mockingbirds.

The local population of game birds has been so greatly reduced in the past few years that the California Division of Fish and Game has not been able to carry out its plans to trap the annual surplus and use it to restock other areas (Glading, Enderlin, and Hjersman, Calif. Fish and Game, 31, 1945:139-156). Mr. Fred Ross, who is currently in charge of this game refuge, states in his letter of March 6, 1949, that the shortage of natural feed seems to be the ceiling factor. The watering devices are still being inspected twice a year, and some of the plantings for roost and escape cover are growing well. He also states: "Many birds were trapped, banded, tested for quail malaria and released again at trapping site in the years 1942-46 . . . . It would have been much better for hundreds of birds if we had been able to move them to areas containing better feed. Four check areas, 7Q, 2P, 27J, 19J, are censused twice annually in order that we may keep in touch with populations and perhaps have an opportunity to correlate fluctuations in Quail numbers with weather and climatic changes. No more Chukars are to be reared or released north of Tehachapi by State Pens, as plants made in this area have not made the desired progress."

Most of the species of birds we have added to our list since March, 1945, may be classed as vagrants or rare visitants. A few are kinds that are fairly common here, but we did not include them before because we had identified them only tentatively. We are including them now because the identifications have been confirmed.

Casmerodius albus. Common Egret. On October 23, 1945, one was standing on the flats just north of Avenal, near the edge of the Kettleman Hills (section 16P). It appeared to be resting, and it flew only short distances as I walked toward it. There are no ponds or other sources of water to attract a wader to the area, the ground being dry and cracked and covered sparsely with short grasses and very low bushes.

Branta canadensis. Canada Goose. The honking of flocks of geese was heard as they flew over Avenal going northwestward on the evenings of February 3, 1945, and February 2, 1946; a flock of about 75 was seen on the afternoon of January 23, 1947. A flock of about 50 geese of this species was seen on the ground on the Kettleman Plain near Avenal on January 20, 1946.

Elanus leucurus. White-tailed Kite. On May 10, 1945, we saw two of these hawks playing in the air over section 19J in the Kettleman Hills.

Accipiter striatus. Sharp-shinned Hawk. One was in an umbrella tree in our yard in Avenal on October 18, 1946, eating a sparrow-sized bird which it held in its claws. One also was seen in or

near our yard occasionally from November 10, 1946, until February 10, 1947, probably the same individual throughout the period.

Buteo swainsoni. Swainson Hawk. Hawks of this species were seen as follows: on the flats east of the Kettleman Hills on April 7, 1945; in Polvadero Gap on April 13, 1944; between Standard of California's 19B Plant and the Guijarral Hills on April 9, 1945 (two hawks) and on May 10, 1945; and on the Kettleman Plain between Avenal and Coalinga on May 24, 1945.

Falco columbarius. Pigeon Hawk. Seen in the Kettleman Hills on section 35J on March 19, 1945, and on section 3P on April 14, 1945; one was eating a small bird on the flats northeast of the Kettleman Hills on October 27, 1945.

Grus canadensis. Sandhill Crane. Notes of cranes were heard as irregular V-shaped flocks flew over the Kettleman Plain going northwestward on January 14, 1945 (over 100 birds) and on February 12, 1944 (about 40). Flocks going southeastward were heard and seen on October 25, 1947 (26 birds), October 30, 1947 (200 to 300), November 25, 1947 (about 20), December 9, 1948 (about 130), December 28, 1948 (72 or 73, circling), January 27, 1947 (about 5), and February 10, 1947 (about 32). Flocks were usually seen between 1:30 and 3:00 p.m.

Larus californicus. California Gull. On March 1, 1947, we saw an adult feeding on the carcass of a sheep on the flats just north and west of Kettleman City.

Columba fasciata. Band-tailed Pigeon. In a letter of March 6, 1949, Mr. Fred Ross states that a flock of 30 to 40 birds was seen on section 27J on January 10, 1949.

Otus asio. Screech Owl. George A. Wilson saw one on the night of August 4, 1947, by the lights of the change room at 11P Plant. For a few moments it stood on a handrail about six feet from him, looking around. Then it flew away into the darkness. The previous night Mr. Wilson had found an owl pellet near the rectifier in the plant.

Archilochus alexandri. Black-chinned Hummingbird. A female was in the Chinese elm in our yard on April 24, 1946. There were a few with other hummingbirds in a flowering locust tree in our neighbor's yard on April 19, 1948.

Selasphorus rufus. Rufous Hummingbird. One visited the flowers of vines and trees in and near our yard on March 3, 1947, March 11 and 12, 1945 and 1949, April 13, 1947, and on April 15, 20, and 27, 1948.

Balanosphyra formicivora. Acorn Woodpecker. One was seen moving around a telephone pole behind our yard on September 4, 1947, and on October 28, 1947. One flew over our yard on October 10, 1948.

Asyndesmus lewis. Lewis Woodpecker. One was seen near a house in 3P Camp in the Kettleman Hills on December 3, 1945. Another passed through our neighborhood in Avenal on September 13, 1948.

Sphyrapicus varius. Yellow-bellied Sapsucker. Mrs. H. A. Scharpenberg reported that one was pecking on the trees around her house in 3P Camp in the Kettleman Hills on October 9, 1945, and that it was fighting with a flicker on another day. I saw fresh holes on Chinese elm, Arizona ash, and arbor-vitae in her yard on October 26, 1945. I have seen sapsuckers of this species in or near our yard in Avenal on November 13, 1948, January 2, 1947, January 17, 1949, and January 25, 1948. On more than one occasion there have been fresh holes with sap running down the trunk of our pepper tree.

Empidonax difficilis. Western Flycatcher. Single birds were in the trees in our yard between April 20 and June 20 in 1944, 1945, 1946, 1947, and 1948, and between August 19 and October 20 in 1944, 1946, and 1947.

Nuttallornis borealis. Olive-sided Flycatcher. Seen in a yard in 3P Camp on September 6, 1945, and on the power lines behind our yard in Avenal on September 16, 1945, and between May 16 and July 25 in 1946, 1947, and 1948.

Tachycineta thalassina. Violet-green Swallow. On the afternoon of March 17, 1949, I saw a flock of 13 flying over the flats north of our house and several more flying over our yard. We have seen them several times recently flying over the fields near Coalinga.

Psaltriparus minimus. Bush-tit. In 1945 we saw flocks drifting through the trees in our yard on September 21, October 10, November 22, and December 26.

Toxostoma lecontei. LeConte Thrasher. In his letter of March 6, 1949, Mr. Fred Ross states that this species was "seen on west side of hills near present site of one of our 'Guzzlers' (self-maintaining watering device) in August, 1942."

Ixoreus naevius. Varied Thrush. On November 9, 1948, I saw one running on the lawn like a Robin. When I approached, it flew up into one of our umbrella trees, then flew to some cottonwoods half a block to the east. One was on the front lawn of the Avenal High School near the eucalyptus trees on March 7, 1949.

Phainopepla nitens. Phainopepla. George A. Wilson saw one flying across our yard on September 3, 1948.

Vireo gilvus. Warbling Vireo. Seen in our trees on April 28, 1947, April 28, 1948, May 14, 1948 (singing), May 20, 1946, August 13, 1946 (an adult and three young), August 14, 1946, and September 14, 1946.

Vermivora celata. Orange-crowned Warbler. Seen in our trees on September 16 and 20, 1945, March 12, 1949, April 20, 1947, and May 6, 1948.

Vermivora ruficapilla. Nashville Warbler. One with a Pileolated Warbler was eating aphids in the vines on the trellises over our front porch on April 30 and May 1, 1948.

Dendroica nigrescens. Black-throated Gray Warbler. Seen in this area when there were storms in the mountains to the southwest. One bird was seen in the cottonwoods on section 11P on October 5, 1945. One was in our umbrella trees on April 28, 1948.

Dendroica townsendi. Townsend Warbler. A female was hopping about among the leaves and branches of cottonwoods on section 11P on May 17 and 22, 1945.

Geothlypis trichas. Yellow-throat. A male and a female were in our yard all day on May 14, 1946. They stayed close to the ground near shrubbery of some sort, but hunted for insects in the grass. Several times we watched them from distances of about eight feet.

Icteria virens. Chat. Heard and seen in our trees between May 2 and 19 in 1946, 1947, and 1948; single birds, usually very shy.

Piranga ludoviciana. Western Tanager. We have seen them in our trees between April 25 and August 26 in 1946, 1947, and 1948, with increasing frequency each year. There were four on our back lawn on May 5, 1948, apparently catching insects in the grass.

Passerina amoena. Lazuli Bunting. Two, evidently male and female, were seen on the power lines behind our yard on August 15, 1946.

Hesperiphona vespertina. Evening Grosbeak. Three females and a male were eating seeds from the ground under eucalyptus trees on the front lawn of the Avenal High School on March 6, 1949. A male and five females were at the same place on March 7, 1949, and five females were on our front lawn on March 8, 1949.

Spinus tristis. American Goldfinch. Flocks seen in trees on section 11P in the Kettleman Hills, in our yard in Avenal, and near the Guijarral Hills between March 20 and April 26, 1945, on March 12 and April 4, 1946, on March 26, 1947, and between March 5 and 18, 1949.

Pipilo maculatus. Spotted Towhee. Single birds were in our trees or in our yard on October 5 and 14, 1947, between February 11 and March 12, 1948, and on October 27, 1948.

Amphispiza belli. Bell Sparrow. A few seen in the Kettleman Hills on section 18Q on May 18, 1947.

Zonotrichia coronata. Golden-crowned Sparrow. There was one on our back lawn near the hedge on May 5, 1948, May 6, 1945, and May 7, 1946. One was in a cottonwood by a building on section 11P on May 10, 1945.

Passerella iliaca. Fox Sparrow. About 1:30 p.m. on October 9, 1946, I saw one scratching on the ground under our pepper tree; it soon flew to a small peach tree in our neighbor's yard. It was evidently sick or very tired, for it sat quietly for at least 15 minutes and closed its eyes occasionally while I examined it from distances of four to ten feet. Finally it flew about 25 feet away, scratched on the ground again, and disappeared into a tangle of dry berry vines and weeds.

Of the 103 species now recorded from Avenal and the Kettleman Hills, only 14 seem to be common or abundant here. Thirty-two may be classed as fairly common in the proper season. All the rest (57 species) appear to be of rare or casual occurrence, for we have seen them only once or just a few times.

Recent records show that the early and late dates of many of the species discussed in 1945 should be extended a month or two. Some of the changes are great enough to be noted here. Species whose status or dates of occurrence have been altered by observations made since 1945 are as follows:

Residents:

Barn Owl. Fairly common.
Say Phoebe. Fairly common.
Rock Wren. Fairly common.
Brewer Blackbird. Common.

Summer visitants:

Bullock Oriole. Fairly common. April to July; September. Breeds.
Black-headed Grosbeak. Fairly common. April, May; July to September.

Winter visitants:

Hermit Thrush. Fairly common. September to May.
Cedar Waxwing. Common. October to May (one in August).

Migrant:

Oregon Junco. Fairly common. March, April; October to December.

Avenal, California, March 21, 1949.

FROM FIELD AND STUDY

The San Blas Jay in Arizona.—On December 19, 1937, Mr. and Mrs. William X. Foerster, William T. Hudspeth, and the writer saw a flock of at least six (probably about eight) jays moving gradually eastward among the mesquite bushes along an irrigation ditch in the Rillito valley some six miles northeast of Tucson, Arizona. With Hudspeth's assistance, I secured two of these birds, which proved to be immature San Blas Jays (*Cissilopha san-blasiana nelsoni*). No others were seen on subsequent trips there that winter nor in the following summer. Twice I walked east a mile or more, but saw nothing of them. On December 18, 1938, however, an adult male was discovered about two miles east of our point of observation by Edouard C. Jacot, who was participating in a "Christmas bird census"; this bird was collected the next day. Shortly thereafter, on January 15, 1939, I took another adult male in the Rillito bottoms at old Fort Lowell, halfway between the other two points of occurrence. This closed the history of the flight. None was detected on a number of trips to the original site, nor on occasional trips to the Fort, in the course of the next 18 months, nor have any been seen since my departure in 1940. At no time did they appear elsewhere in the Tucson valley.

Because of the great distance to Tucson from the normal range of these supposedly non-migratory jays in western Mexico, it was logical to suspect human agency in their occurrence. All lines of inquiry have proved fruitless, however; I have found no possible source of escape nor probability of transportation by man. Furthermore, the first two birds were young of the year in unworn plumage, and none of the birds showed any evidence of having been in captivity.

A striking fact about these jays was the varying shapes of their crests. The two immatures had a tuft of long, bushy feathers growing forward somewhat as in *Lophortyx*, but closer to the bill and less slender. The adults, on the other hand, had only a very slight crest of a few short, thin feathers, which were appressed to the crown instead of pointing forward. If such structural differences are purely matters of age, they give strong support to the contention of Amadon (Am. Mus. Novitates 1251, 1944) that most of our alleged genera of jays should be united; in fact, my own impression is that Amadon did not go quite far enough. It is time we recognized that color is not a generic character.

For racial identification of these jays, I am indebted to Dr. Herbert Friedmann, at whose suggestion this note is written.—ALLAN R. PHILLIPS, *Museum of Northern Arizona, Flagstaff, Arizona, August 9, 1949.*

Bibliographical Notes on the Birds of Washington, by Dawson and Bowles.—The "Birds of Washington," by William Leon Dawson, assisted by John Hooper Bowles, was distributed to subscribers in August of 1909 after a long delay in preparation. At the time of publication it was the most impressive bird book that had ever been printed describing the birds of any small territorial section of the United States. The many beautiful bindings in the numerous editions covered the descriptions of all forms of bird life then known in the state of Washington. It should be remembered that the population of Washington State in 1909 was not large and Mr. Dawson ordered 1250 copies of all his so-called editions, deeming that number enough to satisfy the demands for some time.

Reviewers were so extravagant with their praises of Dawson's descriptive writings, of the color work of Major Brooks, the photogravures and original photographs, and the beautiful bindings that the books immediately sold out and became book collectors' items.

There has been much controversy about the different editions, such that I have been tempted to try to clear up this situation. I was not acquainted with Dawson at the time of publication of these volumes but was very friendly with him in the later years after he came to California to work on "The Birds of California." Mrs. Dawson has recently given me all assistance possible in this undertaking.

The entire edition of all formats was printed at one time, a run of the press continuously until finished. The printed page of each so-called edition is identical with the corresponding page of every other, having been printed from the same undisturbed forms, and in this sense there is, of course, but one edition. The number of color-plates, photogravures, the Roman numeral pages containing lists of the subscribers and illustrations for some de luxe editions, along with the authors' signatures, the number of the copy, and the slight edition change on the title page make up the only differences in the editions. Paging continues through the two volumes: volume 1, 1-458; volume 2, 459-997; all the two-volume editions are alike in this respect.

The authors advertised and collected advance subscriptions for the following de luxe editions: Patrons', Tacoma, Artemisia, V(ictoria) and V(ancouver), and Stockholders'. These de luxe editions are the only ones that have all the color-plates, photogravures and tipped-in photographs, and they are printed on Strathmore Japan, all-rag paper. All have the printed lists of subscribers for the particular edition and are numbered and signed by the authors. These are bound in full leather and each edition is designed to please the most fastidious taste. Dawson states that the Artemisia Edition is a sage brush color leather to match the color of the eastern Washington plains. The Tacoma Edition De Luxe was bound in full crushed Levant leather, in blue, inlaid by hand with a special design of the White-tailed Ptarmigan, symbolical of bird life on Mount Tacoma. One set of the de luxe type was bound up for John E. Thayer of Lancaster, Massachusetts. This set was additionally illustrated with 16 original color plates bound in.

All the de luxe editions are royal quarto ($9\frac{1}{2} \times 12\frac{1}{2}$ inches), with bird end-papers and with birds in gold by hand in special designs both on the spines and the front cover. Mrs. Dawson states that the binders had a real problem in locating all the colors of leather that were used in carrying out Mr. Dawson's instructions.

In order to reach out for more subscriptions at lower prices, Dawson issued what he called the large paper editions and sold copies of them for about half the price of the de luxe editions. The large paper editions were the same size as the de luxe editions but were printed on a cheaper grade of paper and were bound in two volumes in heavy gray binding boards. They contained all the color-plates and all the photogravures as in the de luxe editions but only about half of the inserted photographs. The large paper copies appeared in two so-called editions: (1) Large Paper Edition, and (2) V(ictoria) and V(ancouver) Large Paper Edition. These issues were signed and numbered by the authors, but I have noted some copies that were unsigned by Bowles.

Dawson's popular editions of the "Birds of Washington" were somewhat smaller in size; being $7\frac{3}{4} \times 10\frac{1}{2}$ inches and were issued in two volumes in three bindings: plain buckram, $\frac{3}{4}$ leather, and full leather in many color combinations. These cheaper editions were beautifully bound, for Dawson's esthetic taste would not tolerate anything but the best the money afforded. These editions only contained 12 color-plates and only two photographs and retailed at prices from $10.00 to $15.00.

The popular editions were published under three names: British Columbia, Original, and Authors' Edition. As far as I have been able to learn the Authors' Edition is the only one of this group that is supposed to be autographed, but these smaller format editions are numbered. They are not all autographed by both authors; some few copies are not numbered.

A Teachers' Edition of 200 copies was bound in one volume in a cheap buckram and contained only one color plate. Mr. Dawson was so disappointed in the general appearance of this one-volume edition, which he had earmarked to sell at $5.00, that after withdrawing a few copies for his collector friends, the entire balance was consigned to the furnace.

The following are the numbers issued of all the so-called editions:

Patrons' De Luxe	85		
Tacoma De Luxe	19		
Artemisia De Luxe	21		
Stockholders' De Luxe	34		
V(ictoria) and V(ancouver)	22	total de luxe sets	181
Large Paper	192		
Large Paper V and V	11	total large paper sets	203
British Columbia	55		
Authors'	250		
Original	350	total smaller format	655
Teachers' [200 printed, only 25 (?) saved]			25
		total of all editions	1064

—W. Lee Chambers, *Topanga, California, August 15, 1949.*

A Comparison of Pipilo ocai and the Fossil Pipilo angelensis.—A comparison of *Pipilo angelensis* of the Rancho La Brea Pleistocene and *Pipilo ocai* of Mexico was not made in the description of the fossil (Dawson, Condor, 50, 1948:57-63) due to the lack of comparative material of the latter. Through the kindness of Alden H. Miller, a specimen of *ocai*, recently acquired by the Museum of Vertebrate Zoology, has been made available for my study. The comparison is of the premaxillary and associated parts which form the upper mandible, the element which serves as the type of *Pipilo angelensis*.

Pipilo ocai lacks the short longitudinal ridge found in the fossil just medial to the junction of the superior and inferior nasal processes on the superior process. The profile of the internarial bridge is more elevated than that of *Pipilo angelensis* and drops more abruptly to join the posterior part of the premaxillary. In addition to the marked differences in shape, *Pipilo ocai*, judging from the one specimen examined, seems to have a longer premaxillary and higher, though relatively shorter, nares than the fossil (see table). All measurements suggest that the Pleistocene towhee was a smaller bird than the Recent *Pipilo ocai*.

Measurements in mm.	*Pipilo angelensis*		*Pipilo ocai* (M.V.Z. no. 115341)
	Type	Cotype	
(a) Width across maxillaries	7.6	7.6	8.4
(b) Height at front of nares	3.1	2.9	3.8
(c) Length from anterior end of nares to tip of mandible	8.7±	8.7±	9.4
(d) Length of nostril	5.4	5.3	5.3
(e) Height of nostril	3.2	3.1	3.8
Ratios (in per cent)			
a to c	87.3	87.3	89.4
b to a	40.8	38.1	45.2
d to c	62.1	60.9	56.4
e to d	59.3	58.3	71.7

—William R. Dawson, *University of California at Los Angeles, August 8, 1949.*

Heavy Winter Mortality in Pacific Coast Varied Thrushes.—The severity of the winter weather during February, 1949, and its fatal effect on some species of birds, was brought forcefully to my attention in the course of a winter automobile trip, on February 6 to 8, from Reedsport, Oregon, over the Oregon coast and redwood highways to Laytonville, California. The trip was through intermittent storms of wind-driven snow, rain, sleet and hail. Near Pistol, Oregon, at 1700 feet elevation, the highway had just been made passable through a four-foot depth of fresh snow.

Arriving at Reedsport in late forenoon, I proceeded south over the Oregon coast highway and soon began to see dozens of Varied Thrushes (*Ixoreus naevius*) on and immediately adjacent to the highway. These birds seemed to be searching for food which they must recently have had great difficulty in finding. Many had made the not-normal, but fatal mistake of lingering too long on the highway before taking weak and slow flights to places of safety. After miles of continuing to encounter literally scores of car-killed thrushes, I made an occasional stop to examine them carefully. Their ordinarily rounded breasts had not a trace of fat and the breast muscles lacked the plumpness so common in healthy birds. The breast bones were sharp and altogether too prominent.

Considering that bad weather conditions prevailed not only during our trip but generally throughout the month of February and that great numbers of dead and very weak Varied Thrushes were so commonly seen, it seems safe to conclude that literally thousands of these birds must have perished. That any could have survived the winter, seems a wonder. It would be of much interest to learn whether observers who have visited southwestern Oregon and northwestern California since last winter have noted scarcity of Varied Thrushes. Certainly only extremely hardy individuals fortunate to find food in sufficient quantity to carry them through could have survived.

I recall a previous serious loss of Varied Thrushes in northwestern Washington in the winter of 1915-1916 when Bellingham experienced near-zero temperatures and a three-foot fall of snow that did not disappear for three weeks. Hundreds of Varied Thrushes invaded the city seeking food and the house cat population waxed fat at the expense of these unfortunate birds of the deep woods. When spring arrived, Varied Thrush feathers in considerable abundance were noted in sheds and under buildings having space for a cat retreat.—Webster R. Ransom, *Seattle, Washington, August 7, 1949.*

History of a Wintering Harris Sparrow at Berkeley, California.—An immature Harris Sparrow (*Zonotrichia querula*) was first observed near my home in north Berkeley, California, on the morning of November 22, 1948. It was foraging on the ground in association with Gambel White-crowned Sparrows (*Zonotrichia leucophrys gambelii*). It was not seen again until November 26, when it, or another individual, was seen going to a feeding station for the first time. It was seen daily the rest of November, 25 days in December, 29 days in January, 1949, 24 days in February, 26 days in March (heard singing three of the days not seen), 18 days in April to and including the 19th, which was the last day it was seen. Observations were generally made from 9:00 a.m. to 1:00 p.m.

My garden, in which these observations were made, is part of an almost continuous strip of native live oak and toyon with a scattering of redwood, deodar, atlantic cedar, pine, spruce, acacia, eucalyptus and garden association extending for about one-half mile north and south just above the first sharp rise in the slope of the Berkeley Hills. This strip connects on the north with a canyon in which the flora is somewhat more in the original native state and the cover is heavy. The garden is almost never visited by Nuttall White-crowned Sparrows or English Sparrows which are resident 100 yards below.

Some interest was shown by the Harris Sparrow in suet, finely chopped meat, weed seed, "Instant Ralston" breakfast cereal (salvage), both plain, and baked with waste kitchen fat and a small amount of baking soda and salt. None of these except baked cereal was taken consistently. Sunflower seeds were not eaten. By far the greatest amount of feeding was done in the tops of the live oaks where animal food appeared to be taken. An especial interest was shown in the dried pomes of pyracantha left on the bushes in the late winter. The eating of grass was observed on several occasions.

The plumage, as recorded on November 22, was "Head brown, crown finely marked, cheeks buffy, fine black line on sides of throat, throat white, irregular black blotch across breast below white throat, bill dark flesh color." On November 26, the crown was darker, the throat grayish, and the black was more concentrated at the center of the breast blotch. The black lines at the sides of throat seemed less distinct. The tail feathers were of uneven length, with those at rest on top approximately 1 cm. shorter than those below. The tail feathers gradually grew out until by December 11 they appeared all about the same length. There was no further discernible change until March 14, when more black was noted on the chin. On March 22 I noted: "More and more black on throat and face, especially about the bill, and buffy streaks on sides showing black at forward end." April 9: "More black on face, throat, breast and sides. The bill, which lost color somewhat during the winter, again deep flesh." April 11: "Notably darker, daily, on face and throat. Streaking on sides now almost entirely black on left side; on the right side it is faded buff except at the front where it is black." April 16: "Throat appears solid black." April 19: "Cheeks definitely gray and crown black."

The first observation of song was on February 14. The song included notes in the lower register of the song of the Gambel Sparrow mixed with high squeaking sounds; it generally ended in a coarse croak. There was little of the plaintive quality heard later. There seemed to be no repetition of phrases then or later. Characteristic sounds were merely delivered singly and in combination. By mid-March the song had taken on a more musical quality and consisted primarily of a long, loud, quavering, musical note descending slightly in pitch, followed by one or more notes of less volume, sometimes lower in pitch. In addition to the wholly musical song, musical notes were often included in a series of coarse sounds. Also heard occasionally was a "chup-chup-chup." From mid-March on, the song increased to such an extent that it invariably preceded sight observations.

A peculiar mannerism of this individual was the way in which it picked up dead leaves from the ground and turned them over by the petiole, sometimes carrying them up into adjacent cover. No satisfactory explanation was found for this habit, as observation failed to disclose any food obtained from the leaves. Also characteristic was the extremely rapid pursuit of Gambel Sparrows. This pursuit increased in frequency and energy as spring progressed. It seemed that an individual Gambel Sparrow was selected for this attention in any one period and other Gambel Sparrows, as well as members of all other species, were ignored. During the pursuit, the Gambel Sparrow was followed in all of its turnings, often at a distance of a foot or less, into the nearest cover and even about in the cover. This Harris Sparrow was never seen except in the presence of Gambel White-crowns. Flight when disturbed was invariably into tall shrubs or low trees. Although there seems to have been little wandering of this bird during the period of observation, a Harris Sparrow, probably this individual, was reported on January 17, by Mrs. J. A. Berry at 85 Menlo Place, about one-third of a mile north,

on the rim of the canyon mentioned before. A report of a Harris Sparrow by Mr. Dudley Beeson in San Leandro on February 9 was undoubtedly of another individual.—RUSSELL H. PRAY, *Berkeley, California, August 4, 1949.*

Second Record of the Ross Goose from Arizona.—On December 10, 1948, Dave Mitchell and Bill Baxter of the Arizona Game Department confiscated a white goose, taken by a hunter near the northern boundary of the Havasu Lake National Wildlife Refuge. This was at a boat dock, known locally as Five-Mile Landing, which is situated on the Arizona side of the Colorado River near Topock, Mohave County. The dead bird was given to me, and a skin was prepared from it. The specimen was sent to Alden H. Miller for comparison and positive identification and proved to be a typical first-year male of the Ross Goose (*Chen rossii*). It lacked the warty protuberances at the base of the upper mandible that are characteristic of adults of this species.

The presence of the Ross Goose along the Colorado River had been indicated to the writer by hunters who had told of its occasional occurrence with its larger relative, the Snow Goose. The writer knows of another probable kill on the Bill Williams River near its confluence with Lake Havasu, at Parker Dam, Arizona. This occurred in the 1947 waterfowl hunting season, but since no examination of the bird was made the occurrence may be questioned. However, I have every confidence that the hunter who took this bird is able to recognize a Ross Goose from a Snow Goose. Before the specimen taken in 1948 was obtained, there were no authentic records of occurrence along the Colorado River. Thus this record represents the first of the Ross Goose for the Colorado River valley and the second for the state of Arizona. The only previous record for Arizona to the writer's knowledge is that of Cooke (Auk, 31, 1914:403) who recorded a specimen taken by Dr. Mearns at Fort Verde on October 24, 1887.—WARREN M. PULICH, *Boulder City, Nevada, August 31, 1949.*

A Record of the Short-tailed Albatross.—The publication of Yamashina's report (Tori, 40, 1942:191-270, as summarized in "Japanese Ornithology and Mammalogy during World War II," Wildlife Leaflet 305, Fish and Wildlife Service, 1948, p. 20) of the destruction of the Torishima breeding colony of the Short-tailed Albatross (*Diomedea albatrus*) prompts me to publish a recent observation. A single example of *albatrus* was seen on February 17, 1946, at latitude 37° 08′ N, longitude 124° 29′ W, about seventy miles off San Francisco, while en route to Pearl Harbor aboard the U.S.S. Bowditch. The bird approached the stern twice, the second time coming within fifty yards and making identification through 8× glasses certain. Although there were no Laysan Albatrosses (*D. immutabilis*) present for direct comparison, two were seen the next day, and the difference between the two forms was striking. The white back of the Short-tailed is a most conspicuous field mark and can be seen almost as far as the bird. This individual had the white of the back extending a few inches up the wing. In the air *albatrus* appears larger than the Black-footed Albatross (*D. nigripes*) and the body is much stouter. Its flight is more deliberate, with less swinging and wheeling. The bill appeared to be yellow, although Mayr (Birds Southwest Pacific, 1945:4) gives "pinkish" as the color of the bill in the adult.

Although the summary of Yamashina's article does not specifically state that no Short-tailed Albatrosses have been seen on Torishima since 1933, that is the inference that I draw and that the last definite record was a specimen collected in 1936. The occurrence of a single bird ten years later, while it may raise hopes that birds are still breeding in small numbers, cannot be considered proof of this, since a few non-breeding survivors might still exist.—MELVIN A. TRAYLOR, *Chicago Natural History Museum, Chicago, Illinois, August 4, 1949.*

Record of the European Nightjar in a State of Stupor.—The following quotations are from two letters I recently received from Aldous Huxley concerning the finding of a European Nightjar (*Caprimulgus europaeus*) in an apparent state of coma in England. They recite an incident which has an interesting bearing on my recently published account of the hibernation of the Poor-will (Condor, 51, 1949:105-109).

Mr. Huxley says in a letter dated February 25, 1949, and written from Palm Desert, California: "I was about ten at the time and we were staying at a house in Hertfordshire at the foot of the Chilterns, which is chalk country. My brothers and I were wandering in the park when we noticed a nightjar lying inanimate in a recess between the roots of a tree—I think a beech. We picked up the

bird and found that it was not dead but in a state of coma. I think that we presumed that it was sick and put it back where we had found it. I do not remember that we returned to see if it was still there."

In a letter dated July 11, 1949, he continues: "This incident must have taken place either during the Christmas or Easter holidays: for it occurred at a place where we went only during those holidays. This means that it happened either during the three weeks between December 20th and January 10th or in early April. If the bird was hibernating and not sick we must attribute the incident to the January date, since there would be plenty of insect life available in April."—EDMUND C. JAEGER, *Riverside College, Riverside, California, August 30, 1949.*

A Hummingbird Thief.—A trip into the foothills south of Denver, Colorado, on July 13, 1949, gave me an unexpected opportunity to witness a most unusual example of avian thievery. Robert J. Niedrach had invited me to accompany him on an expedition to take motion pictures of a Broad-tailed Hummingbird (*Selasphorus platycercus*) which he had discovered the preceding day in the process of building her nest. We had hardly arrived on location when we saw a hummingbird alight on the half-built nest, but instead of bringing plant down to add to the structure she helped herself to a generous amount of the material and made off with it. A little later the thief returned for more loot, but now the owner of the nest was present to resist the brigandage. However, the owner's efforts were of little avail, for the thief continued to return for more nest material with which she always departed in the same direction. The next day Niedrach found the nest of the thief about a quarter of a mile away.—FRANK C. CROSS, *Silver Spring, Maryland, September 26, 1949.*

Further Notes on the Birds of Camp Barkeley, Texas.—Vincent P. McLaughlin, Jr., has recently (Auk, 65, 1948:180-188) published his observations of the avifauna of Camp Barkeley, near Abilene, Taylor County, Texas. His excellent description of the "Broad Irrigation Project," which created a temporary marshy oasis in the midst of a desert of mesquite, needs no elaboration here. I was stationed at Camp Barkeley from July 23 to October 30, 1943. Despite the comparative brevity of my stay, I was fortunate enough to note a number of species not mentioned by McLaughlin. For much of this period my quarters were immediately adjacent to the Project, allowing me to make brief observations almost daily. Unfortunately, a substantial portion of my notes from this period were lost somewhere in the confusion of transferring from one army post to another. This is reflected in the list below by the lack of exact dates. However, I have retained enough material to be able to add substantially to McLaughlin's list.

In the following briefly annotated list, I have omitted those species for which my observations add nothing to those of McLaughlin. Species marked with an asterisk are those not reported in McLaughlin's paper.

**Dichromanassa rufescens.* Reddish Egret. One immature seen on August 1. Since publishing this record (Auk, 65, 1948:308), an additional inland record of this species has come to my attention. There is a specimen in the American Museum of Natural History collected by E. A. Mearns at Camp Verde on the Verde River, Arizona, August 27, 1886. Thus mine is the fifth rather than the fourth inland record for the species.

Plegadis mexicana. White-faced Glossy Ibis. Two seen flying overhead, late in August.

**Branta canadensis.* Canada Goose. **Anser albifrons.* White-fronted Goose. A flock of ten geese was observed flying over the camp and landing in one of the ponds of the Project just at sunset in mid-September. Nine of these individuals proved upon closer observation to be White-fronted Geese and one a Canada Goose.

Anas discors. Blue-winged Teal. At least during the fall migration of 1943, the proportion of this species among the waterfowl observed would warrant a higher rating than McLaughlin's "Uncommon migrant."

Ictinia misisippiensis. Mississippi Kite. One or two immature individuals of this species were seen in the summer months, favoring McLaughlin's conjecture that these birds breed in the mesquite near the ponds.

Accipiter striatus. Sharp-shinned Hawk. One September record.

**Callipepla squamata.* Scaled Quail. According to the distribution map in "Principal Game Birds and Mammals of Texas" (Texas Game, Fish and Oyster Commission, 1945:60), Taylor County lies

within the "former range" of this species. The nearest area to Camp Barkeley in which Scaled Quail are now supposed to be present lies in western Nolan and southwestern Runnels counties. I saw two individuals of this species along the railroad tracks near the camp railroad entrance on July 23.

**Rallus limicola.* Virginia Rail. Seen two or three times in the marshes below the ponds. Probably an uncommon fall migrant.

My most outstanding memory of bird-life at Camp Barkeley is of the shore bird migration. While I never saw any flocks (except of phalaropes) that could be described as large, the variety of species more than compensated in interest for the small numbers of individuals. During the height of the migration it was not at all uncommon to have eight to ten species of sandpipers and plovers within the field of the binoculars at one time. The earthen retaining wall about one of the ponds permitted easy concealment, often making it possible to observe these shore birds at a range as close as eight or ten feet.

**Pluvialis dominica.* Golden Plover. One individual, accompanying a small flock of Black-bellied Plovers, in early September.

**Squatarola squatarola.* Black-bellied Plover. Flocks of a half-dozen individuals or less were seen on several occasions in early September.

**Numenius americanus.* Long-billed Curlew. McLaughlin's omission of this spectacular bird is somewhat surprising. Flocks of up to a dozen individuals were seen constantly throughout August, not only at the ponds but flying over the camp proper, often calling loudly.

**Catoptrophorus semipalmatus.* Willet. Uncommon migrant. From one to three individuals were seen occasionally among the mixed shore bird flocks in August.

Ereunetes mauri. Western Sandpiper. Field identification of this species as one of the commonest "peeps" was confirmed by the finding of a live bird which had had a wing torn off, presumably by a predator. A Duck Hawk had been active in the vicinity at about that time and was suspected to be the predator involved.

**Limosa fedoa.* Marbled Godwit. Uncommon migrant. Single individuals occasionally appeared, usually accompanying a flock of curlews.

**Crocethia alba.* Sanderling. One of the last shore birds to pass through, none being seen before early September, and never in large numbers.

Himantopus mexicanus. Black-necked Stilt. McLaughlin is correct in his conjecture that this species bred here. I did not find any nests, but saw parent birds accompanied by young. These seemed to be fully feathered when I first saw them, but they still bore traces of down.

**Lobipes lobatus.* Northern Phalarope. About one-third of the individuals in the large migrating flocks of phalaropes were of this species. They appeared to be slightly later in arriving than were the more abundant Wilson Phalaropes. Both species exhibited the typical phalarope gyrations while feeding in the pools.

Larus pipixcan. Franklin Gull. One large flock (over 100 birds) drifted over the Project in early September. Very few individuals came down to the ponds or marshes. All those seen at close range were in winter plumage.

**Geococcyx californianus.* Roadrunner. One seen in the mesquite near the Project, in early September.

**Centurus aurifrons.* Golden-fronted Woodpecker. McLaughlin lists the Gila Woodpecker, *C. uropygialis,* as an "uncommon permanent resident." *C. uropygialis* is not normally found east of western New Mexico. I believe therefore that McLaughlin's records more probably pertain to *C. aurifrons,* a well-known Texas species, which I observed during September in the mesquite near the Project.

**Myiarchus cinerascens.* Ash-throated Flycatcher. One seen in early August at the outskirts of the cantonment area near the Project. This individual appeared to be in heavily worn plumage.

Corvus cryptoleucus. White-necked Raven. Although McLaughlin lists this species merely as "quite common," my notes compare the milling flocks of ravens over the mesquite to the clouds of gulls following ships in New York Harbor.

Corvus brachyrhynchos. Crow. In almost any large assemblage of the ravens, a few crows could be detected by their cawing. Peterson (Field Guide to Western Birds, 1941:126) is in error when he states that "the Crow does not occur in the range of the White-neck (except in sw. Oklahoma)."

Parus atricristatus. Black-crested Titmouse. Listed by McLaughlin as a "rare resident." In my experience, this species was quite common in the mesquite areas surrounding the Project. I regarded it as one of the three commonest small birds (with the Bewick Wren and the Gnatcatcher) of the mesquite habitat.

**Polioptila caerulea*. Blue-gray Gnatcatcher. Although not listed by McLaughlin, this species, as mentioned above, was one of the three I could nearly always depend on seeing in the mesquite. I do not doubt that they bred in the area. They commonly associated with the titmice while feeding.

**Regulus calendula*. Ruby-crowned Kinglet. A single fall migrant seen, in the area McLaughlin describes as "the drowned woods."

Vermivora ruficapilla. Nashville Warbler. Listed by McLaughlin as a spring migrant only. One, or possibly two individuals seen in September.

Geothlypis trichas. Yellowthroat. McLaughlin gives a single spring record. Several individuals seen and heard in the marshy area below the ponds throughout September.

**Piranga rubra*. Summer Tanager. One male and two females seen in the willows near the ponds, July 25.

**Pipilo maculatus*. Spotted Towhee. One September record.

Calamospiza melanocorys. Lark Bunting. Only two seen by McLaughlin. In late September there was a virtual "wave" of this species, lasting several days. Several could usually be seen during this period on the telegraph wires near the ponds, and more on or near the ground. All were in winter plumage.

**Spizella pallida*. Clay-colored Sparrow. A flight of this species coincided with that of the Lark Buntings. The sparrows lingered somewhat longer than did the buntings.

Recapitulation: total species listed by McLaughlin, 138; species added in present paper, 20; species recorded from Camp Barkeley, 158.—KENNETH C. PARKES, *Laboratory of Ornithology, Cornell University, Ithaca, New York, August 3, 1949.*

Ruddy Quail-Dove in Tamaulipas.—In the spring of 1949 four specimens of the Ruddy Quail-Dove (*Oreopeleia montana*), now in my personal collection, were taken in the vicinity of Pano Ayuctle (Pumpkin Ford) along the Río Sabinas, near the village of Gomez Farias, in southwestern Tamaulipas. The first of these, a female (ovary 9 × 3 mm.; largest ovum 1.5 mm. in diameter), was collected by Paul S. Martin on February 23. The second, a male (testes 8 × 6 mm.), was collected by C. Richard Robins on March 11. The remaining two, a male and female, I took on March 19. The testes of the male were elongate, each being about 12 × 4.5 mm.; the ovary of the female measured about 8 × 6 mm. (the individual ova were only slightly enlarged). All these specimens were taken in thick flood-plain woodland.

Oddly enough, I actually saw the species myself only on March 19, although I was afield daily from January 14 to 29 and again from March 17 to 24. On March 19 I encountered one pair along a shady stretch of road about 400 yards west of the river. The birds must have been feeding in the open at the edge of the road, for they ran into the woods at my approach, the female ahead of the male. When I shot the male, the female flew off, but I could see that she rose only a short way above the ground. The female which I collected that day was a wholly different bird, encountered with a male on the east side of the river, in a narrow patch of well-shaded woodland not far south of camp.

Martin and his party saw very little of the species in 1949. The specimen which Martin collected on February 23 was by itself along the river bank just south of Pano Ayuctle. He shot the bird as it alighted after a short flight through the undergrowth. In the crop of both the Martin and Robins specimens there were large, pea-like seeds which Dr. Robert Clausen of Cornell University has identified as leguminous. On June 14, 1949, Robins saw a Ruddy Quail-Dove flying low over an open cane field not far from Pano Ayuctle.

So far as I know, the Ruddy Quail-Dove has not heretofore been recorded north of the State of Veracruz. The species has an unusually wide range in the New World tropics, however, and so many distinctly tropical forms of animal life have recently been found in the Gomez Farias region of Tamaulipas that this discovery does not surprise me. What does surprise me is our failure to have recorded the bird at all in 1938, 1939, 1941 and 1947, and the failure of Martin and Ernest P. Edwards to have seen it during several weeks of work along the Río Sabinas in April and June of 1948. The

winter weather was unusually severe in Tamaulipas in January, 1949. At the Mesa de Llera, along the main highway just south of Victoria, certain species of cactus were killed by the cold for the first time in decades. It is barely possible that, because of this cold weather and the failure of certain fruits to ripen, some birds (among them the Ruddy Quail-Dove) were forced to move about in search of food. I shall be interested in learning whether the species breeds regularly in the Gomez Farias region. —GEORGE MIKSCH SUTTON, *Museum of Zoology, University of Michigan, Ann Arbor, Michigan, August 11, 1949.*

Unusual Occurrence of Red-winged Blackbirds at Grand Canyon, Arizona.—A note in the Condor (47, 1945:219) calls attention to a winter record of a pair of Red-winged Blackbirds (*Agelaius phoeniceus*) at Grand Canyon on December 13, 1943. Now we wish to record a more surprising winter occurrence of this bird at an elevation of 7000 feet in a piñon pine-juniper-ponderosa pine forest. On January 30, 1949, a flock of male Red-wings, carefully estimated at 35, dropped into a ponderosa pine tree near the mule barns at Grand Canyon, giving their characteristic call notes and displaying their red wing patches. As we watched, a flock of half the size of streaked females flew into a nearby tree. Apparently the same flock of males was again seen on February 1, when they moved through ponderosa pines near the public garage, apparently searching for food on the tips of branches, scattering snow as they worked. The flock of males was seen again on February 4, perched in a ponderosa pine, preening their feathers. On February 6, apparently the same flock of males worked all morning in the ponderosa pines alongside the public garage. They appeared to be after pine seeds in the pine cones, for the wings of the pine seeds fluttered to the ground as they worked and dotted the snow beneath. Soon they found more normal feeding places at the company's mule barn at Yaki Point, where they were noted on February 6, and at the government barns, where 35 were seen feeding on the afternoon of February 8. Again, on February 10, the birds were working in the ponderosa pines near the public garage. When in the same place on February 13, the scattered flock was frightened by a large flock of noisy Piñon Jays and took off with a whirr of wings, perching in a tall pine. As they slowly scattered to their feeding again, I was able to make an accurate count of 71, indicating that the original flock seen had been more than doubled. It then included some females and young males. On February 22, these Red-wings had taken to the few places free of snow along the rim. They were seen several more times up to the end of the month but had disappeared from the area by March 1. During February nearly three feet of snow lay on the ground and there were no places bare of snow for a distance of nearly fifty miles. Ground-feeding birds, like the Spotted Towhee, this winter were seen searching trees for food.—HAROLD C. BRYANT, *Grand Canyon, Arizona, September 12, 1949.*

A Record of the Black-and-white Warbler in Eastern California.—On May 21, 1949, I observed a Black-and-white Warbler (*Mniotilta varia*) near Inyokern, northeastern Kern County, California. The warbler remained at a distance of several yards for two or three minutes, permitting positive identification with the aid of 8-power binoculars. During this time it occupied itself by foraging over the lower trunks of locust trees.

Grinnell and Miller (Pac. Coast Avif. No. 27, 1944:390) cite only two previous records of the Black-and-white Warbler in eastern California: at McGee Creek, Mono County (Dawson, Birds Calif., 1, 1924:438); and at Thermal, Riverside County (Wyman, Condor, 24, 1922:182).—WILLIAM R. FISH, *China Lake, California, October 3, 1949.*

NOTES AND NEWS

HAROLD MICHENER
1882–1949

Admiration for Harold Michener among the numerous company of people engaged in bird banding in the western United States grew steadily from the impact of his quiet, thoughtful, and determined devotion to banding studies. When J. Eugene Law, the pioneer and first advocate of banding in the West, had to curtail his activity in the late '20s, the Micheners, imbued with similar principles, carried on the Laws' tradition and themselves came to lead by the example of their accomplishment and by a warm and steady helpfulness extended to all who wished to do similar work. Harold Michener had a way of bringing forth facts and viewpoints in a completely inostentatious manner and with an honesty and sincerity such as is all too rarely attained by either amateur or professional ornithologist.

Substantial indeed are the findings reported by Mr. and Mrs. Michener as the result of marking 45,000 birds of 85 species, for the birds handled were thoroughly examined for molt, changes in color, signs of nesting activity, and abnormalities. Their attitude in banding was one of inquiry, rather than that solely of capturing birds for personal esthetic enjoyment. This is summed up in the simple explanation of their work made in 1948 in The Gull: We are banding birds "for a serious purpose, the purpose of studying birds." Of persisting value will be the work on winter movements of Purple Finches and the extensive series of investigations on House Finches which, through following molt and plumage sequence in retrapped birds, aided by experimental plucking, have afforded a groundwork essential for proper taxonomic conclusions. "Mockingbirds, their Territories and Individualities" published in 1935 reported events in the lives of color-banded birds and is one of the best documented and interesting studies made in the early years of emphasis on territorial behavior. In fact the winter-held territories of mockers are probably the best understood example of nonbreeding territories even today. To see Michener's care in analysis, one should read of his investigation of birds and electric power lines in which he brought together his profession of engineering and his ornithological ability. Restudy of this would repay anyone undertaking an inquiry of problems of interference of birds with human affairs and interests. And again one can profit in rereading the chapter in the natural history of California Jays derived from the Micheners' watching of birds in their own back yard in Pasadena.

A warm sense of gratitude for the leadership of Harold Michener and for his valuable contributions to the study of birds leads his friends of the Western Bird Banding Association and the Cooper Ornithological Club to establish a memorial to him in the form of a color plate of the Jacana, one of Grayson's paintings, which appears as the frontispiece of this issue of The Condor. It is my privilege to voice this dedication by his friends.—ALDEN H. MILLER.

The two Jacanas represented in Grayson's painting were collected near Tepic, Mexico, in June of 1866. The skins were sent to the Smithsonian Institution. In a letter to S. F. Baird of July 18, 1866, Graylson wrote: "There is no difference in the coloring of the sexes but the female is the larger; this I know by opening several. The young have a whitish breast and the balance of plumage mottled. It is a plant walking bird, lighting on and walking with facility over the moss and other water plants growing on the surface of the water . . . . The iris is dull grey, comb and bill bright yellow, feet greenish, nails brown; between the base of the bill and the comb is a red and purplish streak."

Members of the Cooper Club have recently received an invitation to attend the Annual Meeting at Asilomar, April 14 to 16, 1950. Please respond promptly to the call for papers and also make requests for accommodations. It will help greatly in the conduct of the business meeting if all members will return the proxy form sent out by the officers of the corporation.

Students of western birds should know of the appearance of an "Annotated Check-list of the Birds of Utah" by Angus M. Woodbury, Clarence Cottam, and John W. Sugden (Bull. Univ. Utah, 39, no. 16, 1949:1-40, 1 map). This is a somewhat more detailed list of Utah birds than that of Behle's of 1944. About 53 additional names are included but part of these are dubiously recognizable subspecific units.—A. H. M.

Reprints of about forty articles by the late Dr. W. T. Shaw are available to any persons

interested in them. They will be mailed post free upon request made to Albert C. Hawbecker, Fresno State College, Fresno 4, California.

The Cooper Ornithological Club will again participate in the summer meetings of the American Association for the Advance of Science, Pacific Division, to be held from June 19 to 24 at the University of Utah, Salt Lake City. Papers are scheduled for presentation at a session to be held jointly by the Club and the Pacific Northwest Bird and Mammal Society. Further details concerning the meetings may be obtained by writing Dr. William H. Behle, Department of Biology, University of Utah, who is acting as the Club's representative for the meeting.

Some months ago we appealed to you by letter for a contribution toward the printing of the Grayson paintings. To date our appeal has received heartening support both in dollars and in widespread interest in scientific, artistic and historic circles. The appearance of each colored plate has brought about an increase in interest.

We feel that many members have wanted to give but have hesitated to do so for lack of an answer to the question "How much should I give?" Individual gifts received so far have ranged up to sizable sums. Our objective is to raise in the aggregate an amount which will be commensurate with Grayson's paintings in the field of ornithology. The number of gifts obtained is as important to us as the size of each gift. If every member could give $2.00 we could publish seven more plates. Won't you, therefore, join us in this important undertaking by sending us your gift? Your response will determine the number of plates to be printed in the future. Your help will be deeply appreciated.—C. V. Duff, *1922 Tamarind Ave., Hollywood 28, California.*

COOPER CLUB MEETINGS

NORTHERN DIVISION

January.—The regular monthly meeting of the Northern Division of the Cooper Ornithological Club was held at the University of California, Berkeley, on January 5, 1950. The following proposals for membership were read: Curt Dietz, Box 1753, Stanford, Calif., and M. F. Vessel, San Jose State College, San Jose, Calif., by Charles G. Sibley; Melvin A. Traylor, Jr., Chicago Natural History Museum, Roosevelt Road and Field Drive, Chicago 5, Ill., by Alden H. Miller; Albert B. Ruffner, 1072 Trestle Glen, Oakland, Calif., by R. F. Johnston.

Alden H. Miller, reporting for the Nominating Committee, presented the following slate of officers for 1950: for president, Junea W. Kelly; for vice-presidents, Robert T. Orr and Charles G. Sibley; for secretary, Henry E. Childs, Jr. It was the feeling of the committee that the best interests of the Club would be served by the election of two vice-presidents. The nominees were then duly elected. A motion by Mr. Dunlap was passed expressing the appreciation of the Division to the retiring officers for their services during 1949.

Carl Koford reported that an application for the taking of young California Condors by the San Diego Zoo had been received by the California Fish and Game Commission. A lively discussion followed and on the motion of Mr. Cogswell, the Conservation Committee was instructed to write to various people expressing the Club's disapproval of this undertaking by the San Diego Zoo. "South Carolina Bird Life" by Sprunt and Chamberlain was reviewed briefly by Alden H. Miller. Charles Sibley described the effects of the recent high tides on the birds and mammals at the Alviso Marshes on December 17.

Robert C. Miller, Director of the California Academy of Sciences, spoke on "Wildlife and Conservation Problems in New Zealand."—Henry E. Childs, Jr., *Secretary.*

February.—The regular monthly meeting of the Northern Division of the Cooper Ornithological Club was held at the University of California, Berkeley, on February 2, 1950. The following were proposed for membership: Grace B. Kelly, 1438 Hawthorne Terrace, Berkeley, Calif., a sustaining member, by Charles G. Sibley; Mrs. Oscar McAllister, 129 York Drive, Piedmont 11, Calif., by Mrs. Dunlap; Richard D. Porter, 3130 Ogden Ave., Ogden, Utah, by W. H. Behle; Helmut C. Mueller, 2756 N. Palmer St., Milwaukee 12, Wis., and Robert G. McKenzie, 933 Jefferson St., Quincy, Ill., by A. H. Miller.

The secretary reported that the Point Lobos League requested aid in obtaining a tract of land at the Salinas River mouth for a state park; the matter was referred to the Natural Resources Committee. Junea W. Kelly reviewed "Shore and Marsh" by H. M. Quick.

Lois C. Taylor reported seeing a Condor near Lebec on December 27. Mr. Cogswell saw one there on January 29. He also reported 600 Whistling Swans and 800 Sandhill Cranes between Lodi and Isleton on January 22.

Frank A. Pitelka spoke on "Speciation in Dowitchers."—Henry E. Childs, Jr., *Secretary.*

For Sale, Exchange and Want Column—Each Cooper Club member is entitled to one advertising notice in any issue of The Condor free. Notices of over 5 lines will be charged for at the rate of 25 cents per line. For this department, address SIDNEY B. PEYTON, *R. D. No. 2, Box 260, Fillmore, California.*

FOR SALE—British Museum Catalogue of Birds, vols. 11-21, 23, and 27. Good, clean copies, "tight-bound"; $65, post paid.—W. E. CLYDE TODD, *Carnegie Museum, Pittsburgh 13, Pennsylvania.*

WANTED—Would appreciate receiving gifts of bird study skins to add to the present rather small collection of the Department of Zoology of the University of Massachusetts.—L. M. BARTLETT, *Fernald Hall, Amherst, Massachusetts.*

FOR SALE—Wright's Handbook of Frogs and Toads, 1942, 2nd ed., excellent condition, slightly used; Bishop's Handbook of Salamanders, 1943, excellent condition, brand new; Abram's Illustrated Flora of the Pacific States, vol. 1, 1940, 2nd printing, excellent condition, brand new.—FRED G. EVENDEN, JR., *3434 57th Street, Sacramento, California.*

FOR SALE—Ridgway's Bds. N. and M. Am., no. 1, bound, nos. 4-5-6-7-8-9-10, papers. Bendire's Life Hist., part 1; Jour. Wildlife Mgmt., 1941 to 1949, complete; Casey Woods, The Fundus Oculi of Birds; Ridgway's Manual, 1896. Make cash offer.—STANLEY G. JEWETT, *1404 S. E. Bidwell Street, Portland 2, Oregon.*

PREPARATION OF MANUSCRIPTS FOR THE CONDOR

Articles published in the Condor normally are written by members of the Cooper Ornithological Club. Practically all the Club's money goes into the magazine; no editor and no business manager receive any pay other than the satisfaction of doing a service worthily. The preparation of good copy by the author will contribute greatly to accuracy of published output, dispatch in handling, and economy of production.

To be acceptable for inclusion in the Condor, articles must not duplicate in any substantial way material that is published elsewhere. Any type of subject bearing on birds may be considered; but the geographic areas of primary concern are western North America, Central America, and the Pacific Basin. Manuscripts may be submitted to any one of the editors (see inside front cover for address). Proofs with edited manuscripts will be sent to authors, at which time reprints may be ordered.

In the interests of accuracy and economy, observe the following: do not duplicate data in text, tables, or charts; check citations to original sources and verify text references; quoted statements must be exact replicas of the original; preferably use vernacular names applicable to the entire avian species (for a guide in this regard, see "The Distribution of the Birds of California," Pac. Coast Avif. No. 27, 1944:5-34); in general, avoid subspecific vernaculars; insert scientific names for species but not the subspecific name except in taxonomic papers or where the race concerned has been critically determined by the author or his collaborators; revise the manuscript repeatedly to remove superfluous words and phrases, immaterial detail, and repetitious statements.

Note Condor style and usage. "General Articles" and the "Field and Study" items are set up in different form. Provide a concise, meaningful title, and, where needed, subtitles within the text. Footnotes are not used. The address line may serve to indicate institutional connection, and to it should be added the date of transmittal of the manuscript. Terminal bibliographies are desirable where five or more titles are to be cited; otherwise, the references may be included in the text. For bibliographic style, note closely the practices employed in recent volumes of the journal. A factual summary is recommended for longer papers.

Rules for copy.—(1) typewrite material, using one side of paper only; (2) double space *all* material and leave liberal margins; (3) use 8½ × 11 inch paper of standard weight (avoid onion skin); (4) carbon copies are not acceptable; (5) place tables on separate pages; (6) number pages in upper right hand corner.

Illustrations.—Photographs should be glossy prints of good contrast. Make line drawings with India ink; plan linework and lettering for at least ½ reduction; do not use typewritten labels on the face of the drawing. Provide typed legends on separate sheets.

Helpful references on writing: Manual of Style, University of Chicago Press, and Rules of the Editorial Committee, University of California Press. On scientific nomenclature: A.O.U. Checklist (with supplements 19 through 23) and Pacific Coast Avifauna No. 27; authors are not required to follow either of these works.

THE EDITORS OF THE CONDOR.